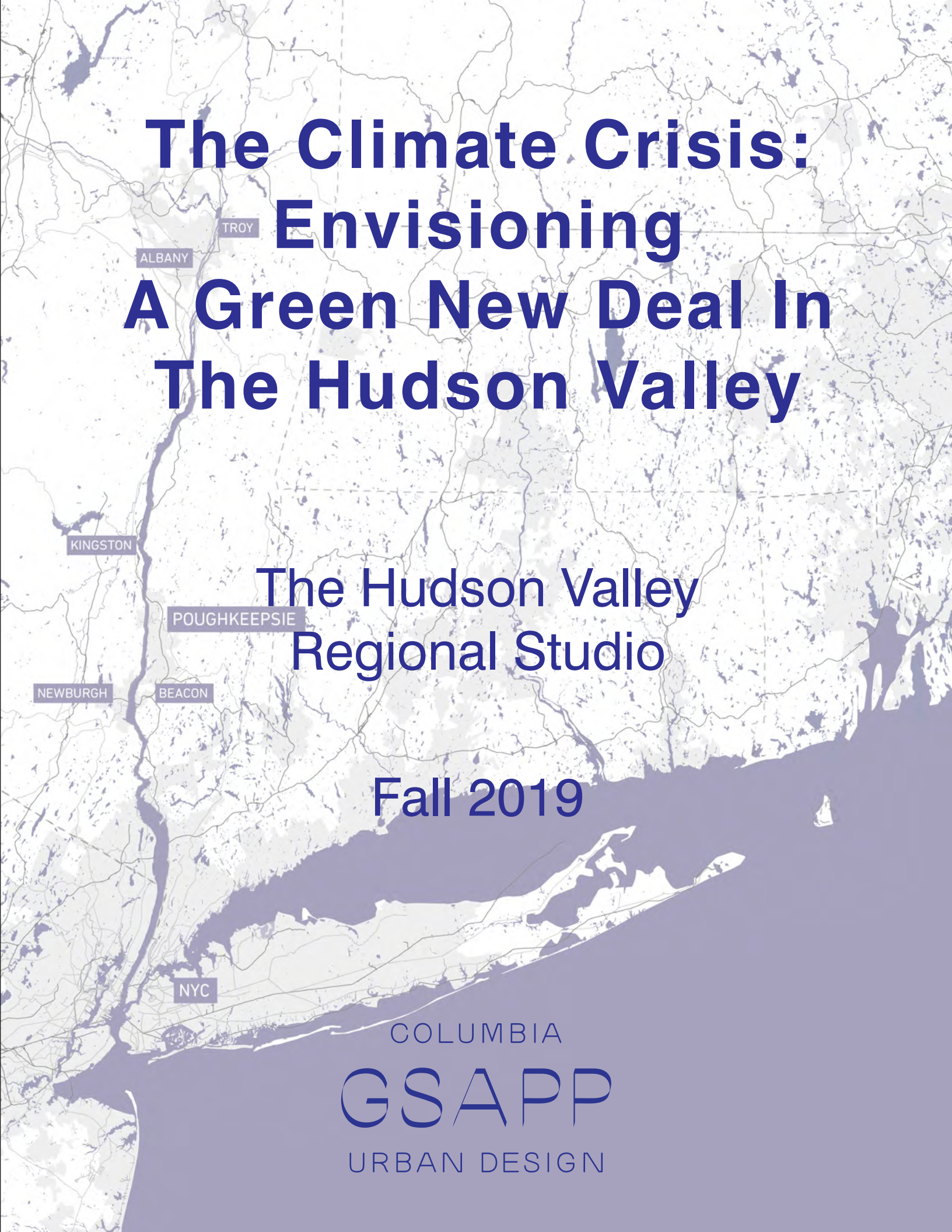
The Climate Crisis: Envisioning A Green New Deal In The Hudson Valley



The Hudson Valley Regional Studio

Fall 2019

COLUMBIA
GSAPP
URBAN DESIGN

URBAN DESIGN PROGRAM

Kate Orff, Director
David Smiley, Assistant Director

FALL SEMESTER STUDIO

Kaja Kühl, Studio Coordinator
Anna Dietzsch, Justin G. Moore, Jerome Haferd, Liz McEnaney, Shachi Pandey, Raafi Rivero, David Smiley and Dragana Zoric, Studio Faculty
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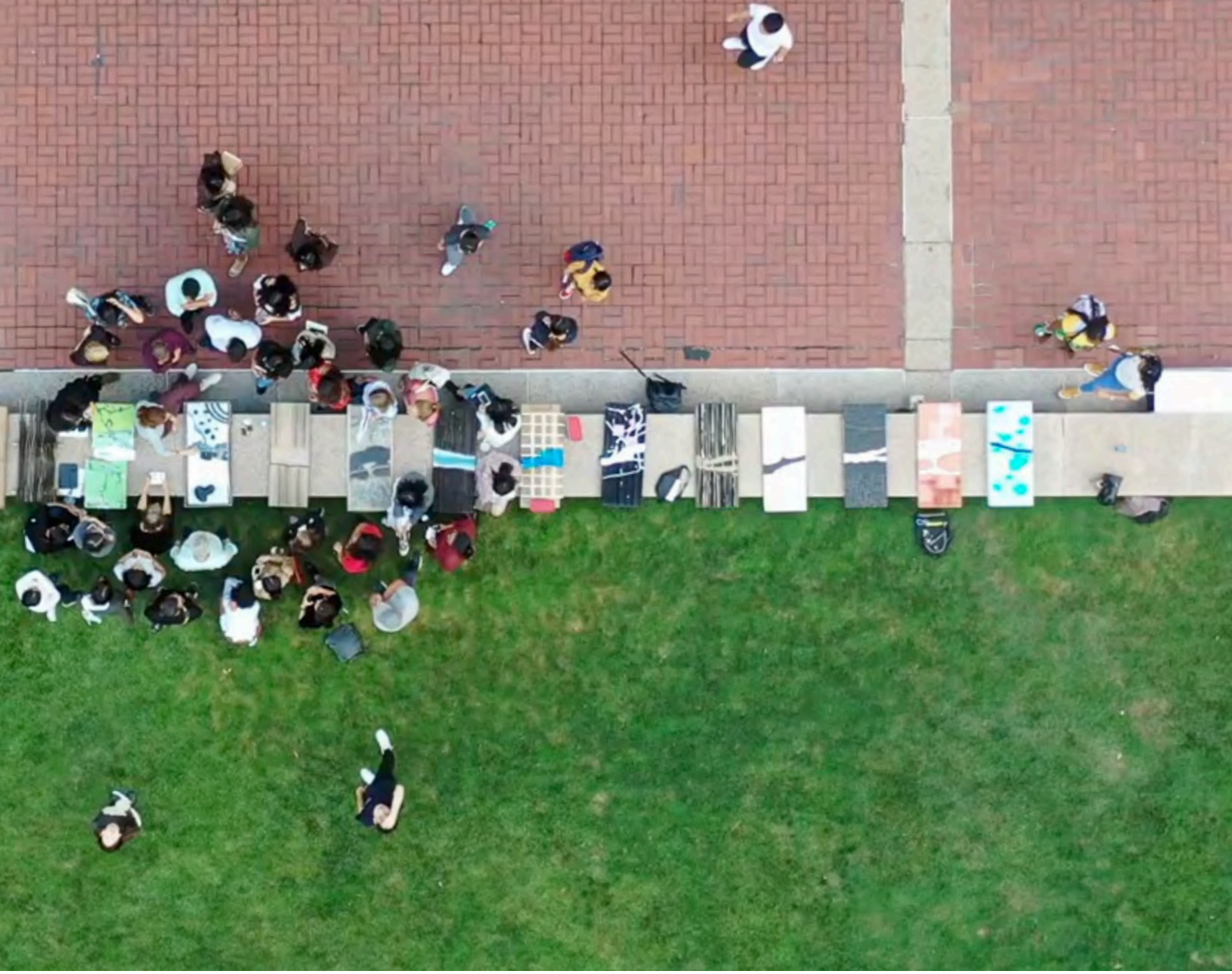
THE HUDSON VALLEY INITIATIVE

Kaja Kühl, Director

Urban Design at Columbia

The Urban Design Program at Columbia GSAPP investigates social, spatial, and climate change in order to help communities learn and shape their own futures. Wherever we work, students and faculty collaborate with local institutions, government officials, professionals, non-profit organizations, and community groups. Urban Design can act as a bridge among these many actors but, just as important, we believe that Urban Design must be an activist practice. Our design work addresses multiple scales, varied needs, and different stakeholders, and we value the shared struggle to create alternatives to present conditions.



The Climate Crisis:
Imagining a Green New Deal in the Hudson Valley

Working in the Hudson Valley, the Fall Urban Design Studio at GSAPP operates at the regional scale and asks students to enter the discourse of urbanization beyond cities to engage unevenly dispersed socio-spatial ecosystems at multiple scales. The Hudson Valley, a region defined by multiple systems, histories, and geographies, touches the lives of millions and has deep connections to New York City, the global metropolis at its southern edge. For this studio, region is defined neither by a political boundary nor a physical area but, in the tradition of Patrick Geddes[1], the region is understood as the integration of settlements, modes of production and consumption, and the topographic and biological contexts in which they take place.

Specifically, the Fall 2019 studio explored the region's rural/urban socio-spatial ecosystems as the site for intervention to address the global climate crisis.

As part of a GSAPP-wide collaboration "Public Works for a Green New Deal," students worked closely with local stakeholders, elected officials, organizations, non-profits, community groups, and planning and design professionals to envision just and equitable pathways towards decarbonizing the region.

The Climate Crisis

The 2018 report by the Intergovernmental Panel on Climate Change (IPCC) found that limiting global warming to 1.5°C would require "rapid and far-reaching transitions in the use of land, energy, industry, buildings, transport, and cities" to make significant reductions in greenhouse gas emissions by 2030 and avert the worst effects of climate disruption.

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1 Daniel Christian Wahl (2017) Design and Planning for People in Place: Sir Patrick Geddes (1854–1932) and the Emergence of Ecological Planning, Ecological Design, and Bioregionalism, Medium, 2017

Climate change is a crisis of unevenly experienced and systemic injustices that challenges scientists, practitioners, and community members alike. At the start of 2019, the US House of Representatives passed Resolution H.R.109 calling for a Green New Deal to substantially reset climate and social policy of the Country. In June 2019, the New York State legislature passed the Climate Leadership and Community Protection Act, a legally binding legislative act to achieve net zero greenhouse gas emissions in New York State by 2050. These efforts complement the global challenge of anthropogenic change, ranging from acts of resistance such as the #fridaysforfuture school strikes to the startling clarity of subsequent IPCC reports, all of which highlight the limited time frame for us to act. They shift our vocabulary from merely acknowledging climate change to embracing the need for systemic action to confront the crisis. Such changes are structural: We need to change the way we live, work, organize, and govern ourselves as a society. Not only do we need to transition to a decarbonized future, however, we must also address the systemic inequalities integral to the globalized urbanization that has brought us to this dire condition.
To urban designers, the Green New Deal reads like a call to action. “Building resilience against climate change-related disasters”, “Upgrading infrastructure”, “Building more sustainable food systems” or “Restoring and protecting threatened, endangered and fragile ecosystems” are but a few of the stated goals in the document that sound familiar to urban designers accustomed to thinking in systems and envisioning built and natural environments to support these goals.

The Hudson Valley

They also sound familiar to practitioners working in the Hudson River Valley, a region of watersheds, forests, farms, small cities and rural hamlets. Narratives of the Hudson River Valley often begin with the histories of pioneering European settlers who started making their marks

on the landscape over 400 years ago, supplanting indigenous peoples, or of the American revolutionaries who did the same 175 years later, and of course, of the prosperous Empire State. In the early 19th century waterpower from tributary streams yielded new factories with new residents and dramatically changed life in the Valley. Transportation infrastructures – the Erie Canal in 1812, the Hudson River Railroad in 1849, and the ever-growing network of roads and bridges brought industry and economic prosperity to the region. Each of the region's resources is in some way marked by its proximity and accessibility - or lack thereof - to New York City, a global metropolis. The prosperity of the region, its small cities and villages, however, was and remains precarious. After decades of industrial growth in the Valley, early and mid-20th century changes to transport, industry, and demographics have decimated Main Streets and farming districts.

Cities such as Newburgh, Kingston, and Poughkeepsie slowly shed population, jobs, investment, and the social networks necessary for community well-being. Mid-century responses to change were often equally destructive, when struggling neighborhoods –typically low-income and minority communities– were demolished in the name of "renewal". At the same time, local farms struggled to compete with factory farms and nationally-scaled agribusiness. Other large corporate employers like IBM closed manufacturing plants and office parks, leaving gigantic scars of asphalt and concrete with little prospect for a second life. While some places have managed to stage "comebacks," income, employment, education, and real estate data show that disparities continue to increase, both in the Valley, and nationally (EIG Distressed Communities Index, 2016).

These challenges are set against the backdrop of one of the most revered landscapes in the American Northeast. Designated in 1996 as a National Heritage Area, its natural beauty inspired one of America's great art movements, the Hudson River School. Home to America's wealthiest

families across the 19th and into the 20th century, the Valley's estates, vistas, lakes and flora were idealized as timeless places of beauty and virtue -- even as emerging industry was already tarnishing that image. The beauty of the Hudson Valley, real and increasingly threatened, also gave birth to environmental activism and the conservation movement, setting precedents for national legislation on protecting the environment from development, pollution and resource extraction.

Designing The Rural

> "As they mobilise their capacities to shape this emergent terrain of intervention, designers confront an important ethical choice – to help produce maximally profitable operational landscapes for capital accumulation; or alternatively, to explore new ways of appropriating and reorganising the non-city geographies of urbanisation for collective uses and for the common good."
>
> Neil Brenner, The Hinterland Urbanized

For several decades, architects and planners have focused primarily on the growth of cities and the threshold of more than 50% of the world's population becoming city dwellers. Rural spaces, on the other hand, are often associated with economic decline, stagnation and political isolation. The Fall Urban Design Studio at Columbia GSAPP brings into focus the territories and places where the other 50% live: Small towns, villages, rural landscapes and farmland. It discusses the relationship between country and city - not as in opposition, of "rural" and "urban" but as a relationship between people and nature, between settlement and landscape, and society and its resources. With the steady advance of technology, the antithetical distinctions between city and countryside, center and periphery, culture and nature have increasingly dissolved. Flows of material, food,

water and energy from the region to the city are countered with flows of people, investment, culture and waste. The often cited “Brooklynization” of the Hudson Valley –a growing number of city-dwellers moving north– is one of many flows between the city and countryside that dissolve this distinction. Simultaneously, romanticizing rural space as a site of the natural and authentic, as a victim of industrialization and urbanization, is coming into question. Rural regions – small towns, villages, landscapes, farms, hinterlands – can no longer be understood as places “left behind” by cities but instead are sites of production, inhabitation, knowledge as well as conflict. As designers, we play a critical role in envisioning the future of these territories.

Central to the studio discussions and the work presented here are the unique relationships and dependencies between individual places, the larger region and its relationship to the metropolis at its southern tip, New York City. The valley offers lessons for urban design intervention at various scales, interpreting varied perceptions, and challenging the geography of decision-making. While each of the projects aims to be site-specific, they respond to a regional investigation of systems, infrastructure, networks or recurring phenomena. Several projects interrogate the post-industrial landscape of the region. Sited primarily along the Hudson River at a time when water-based travel was the most efficient, the revered landscape is now dotted with hundreds of acres of abandoned sites. Student projects explore a variety of narratives for these sites from potential for future economic opportunity to utilizing the scarred land for clean power generation and reforestation.
Another series of projects focussed on the small cities and towns as sites for systemic intervention. Newburgh, Poughkeepsie, and Kingston have historically played a significant role as urban centers on the Hudson River. Plagued by a declining manufacturing base, decreasing populations, compounded by urban renewal in the 20th century, these cities are facing new and old challenges. How can existing urban spaces such as urban

waterfronts and decaying main streets be reactivated and invigorated, reduce its residents carbon footprint while offering opportunities for affordable housing, economic growth and jobs? Within cities, public and institutional buildings constitute a separate important spatial category for intervention. Hospitals, prisons, government offices, and schools are important employers throughout the region. Their outdated facilities and operations are often the worst offenders when it comes to Greenhouse Gas emissions and environmental practices. Yet, the idea of “Public Works” could not be more directly applied in several of the projects that address public institutions and their ability to innovate greenhouse gas reduction, while better serving the public.

Many of the cities in the region lost population and businesses to its suburban surroundings in the 20th century, seen as the superior alternative for living then. These spaces now too are ripe for innovation. Several projects question the car-dependency and excessive use of asphalt and concrete generated by suburban communities, shopping malls and office parks.

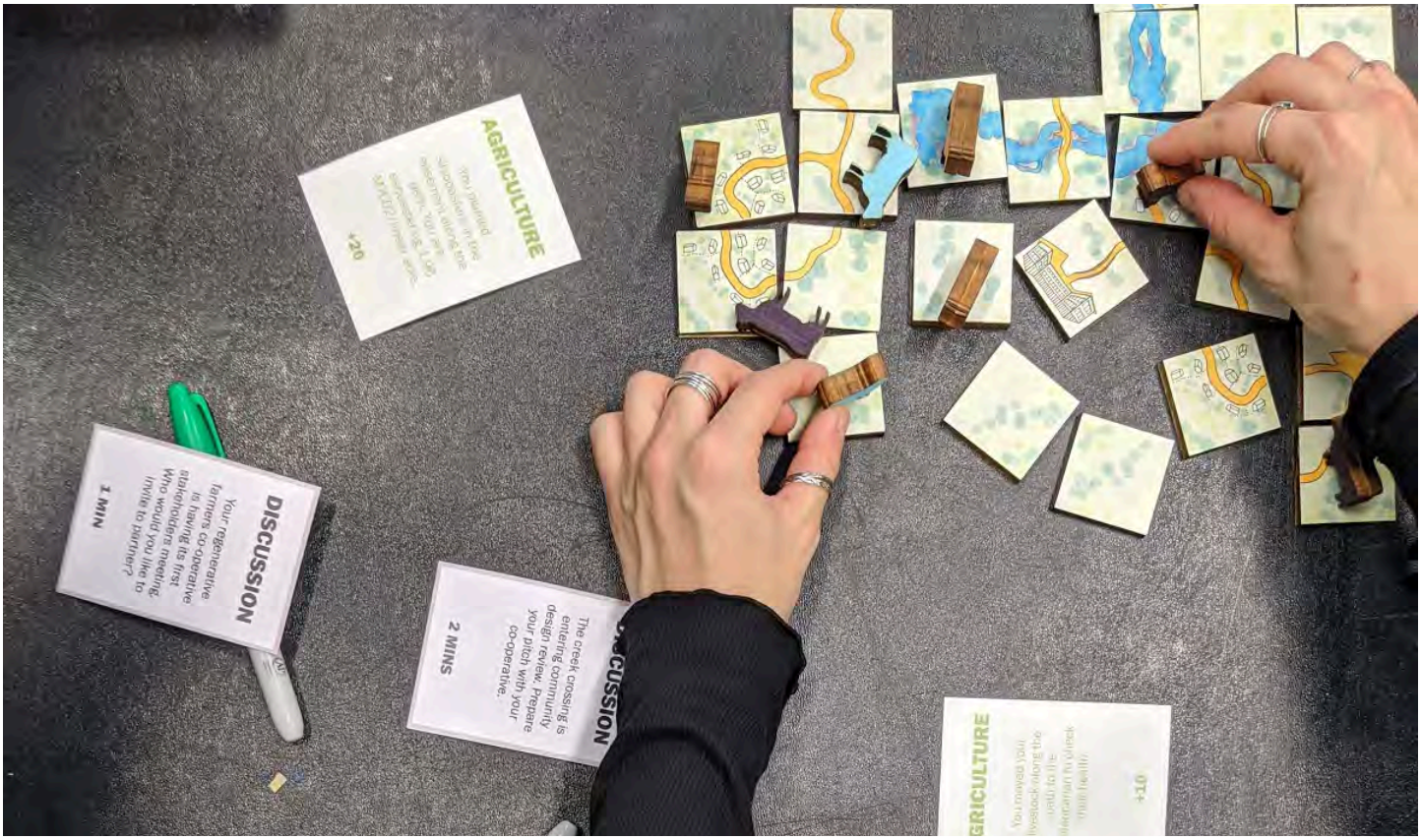
Lastly, a category of projects seeks to identify opportunities for sequestering carbon emissions using nature as a tool. Both, agriculture as well as forests have a long history in the region. These projects expand the repertoire of urban designers with a focus on the unbuilt systems that can contribute to addressing the climate crisis. All of the projects are intended to spark conversation, inform and promote collaboration with and between those who are passionate about a just transition to a clean and equitable future for all communities across the Hudson Valley region. We are grateful for the many conversations, for feedback and comments along the way.

Columbia University Urban Design
Fall Semester Studio Faculty Team

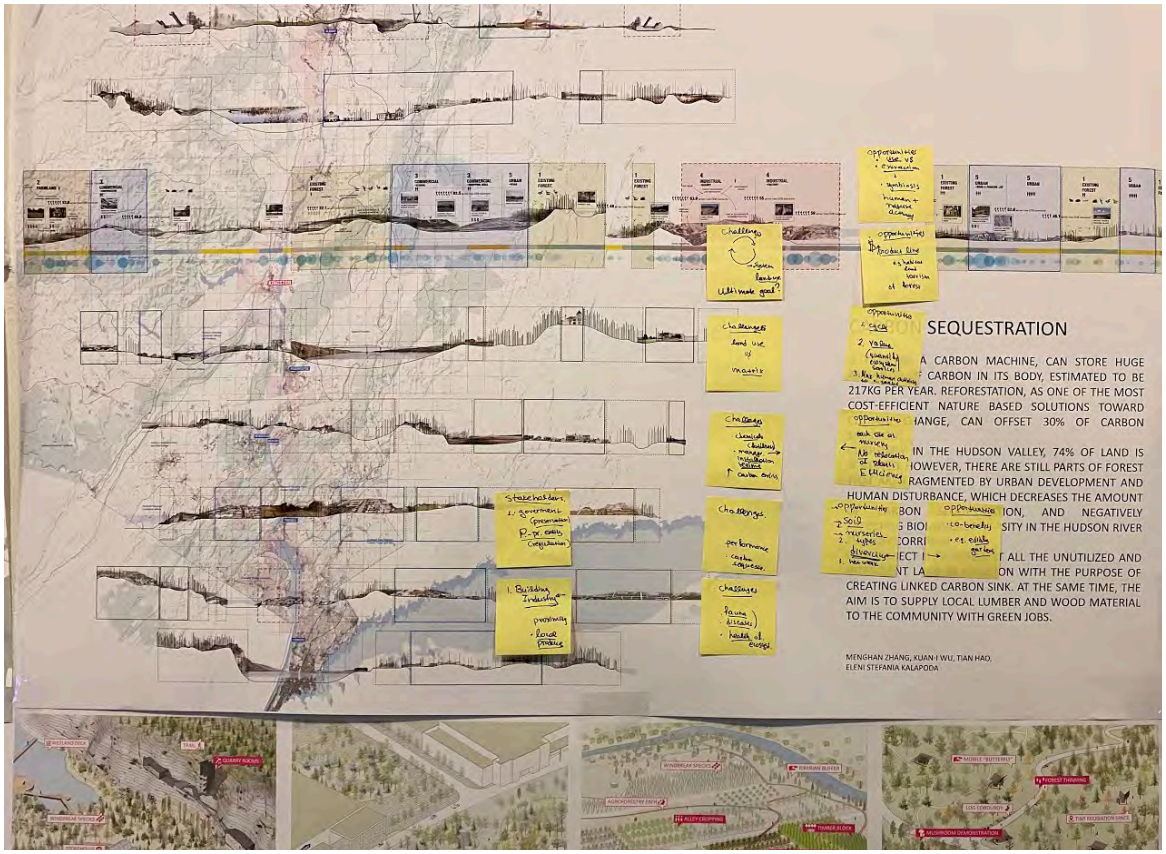
LEARNING AND SHARING

Site Visits And Workshops


COLUMBIA

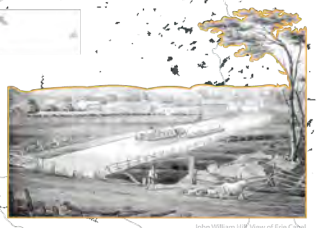

AGRICULTURE
+20
DISCUSSION
Your regenerative farmers co-operative is having its first stakeholders meeting. Who would you like to invite to partner?
1 MIN
DISCUSSION
The creek crossing is entering community design review. Prepare your pitch with your co-operative.
2 MINS
AGRICULTURE
+10

STUDENT WORK



POST-INDUSTRIAL LANDSCAPES

ERIE CANAL AND GREAT LAKES



CO2 Emissions
Cost
Speed
Accesibility

CLEAN
CHEAP
CONVENIENT

CANADA

HISTORICAL IDENTITY OF THE WATER

PERMEABLE INDUSTRIAL USES

UNDERUTILIZED WATERWAYS

ABANDONED AND AGING INFRASTRUCTURE

ALBANY
HUDSON
KINGSTON
PORT OF NEWBURGH
NEW YORK CITY
PORT OF NY - NJ
PORT OF NEWARK
HUNTS POINT

- Farms
- Beverages
- Agriculture/Food products
- Railways
- Freight Routes
- Interstate Highways
- Beverages flows to destination
- Agriculture/Food flows to destination
- Barge Routes

N

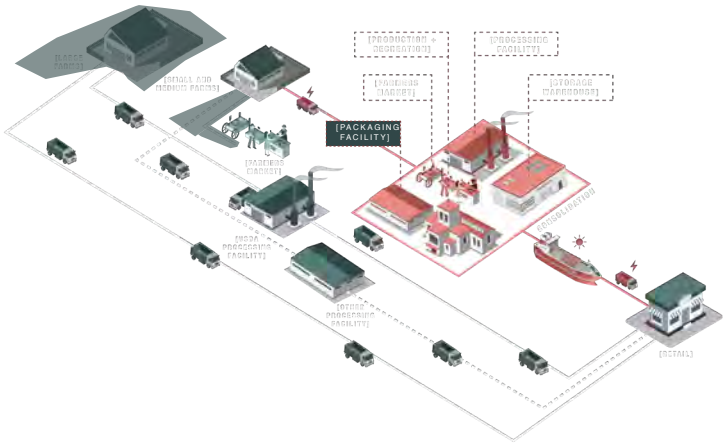
GOOD(S) SHIFT REVITALIZING THE PORT OF NEWBURGH

Antonia Medina Abell, Hugo Bovea, Tal Fuerst, Sharvari Raje

Trucks are one of the largest contributors to air pollution in the Hudson Valley, and function within an unbalanced system. 84% of the freight transported in New York State is moved by truck while other modes of transportation such as railways and waterways are underutilized. Among the goods transported in the region, food is a top carbon emitter. Yet, many small and medium-sized farmers lack processing infrastructure and cannot reach production capacities.

GOOD(S) SHIFT is a working waterfront that joins two vital segments of the Hudson Valley's agricultural operations: processing and distribution. The port will become one of a series of hubs that integrates diverse and intermodal operations, employs local residents, and models the transition towards a less carbon intensive transportation infrastructure for the Hudson Valley.

See the project's video here:
https://vimeo.com/380162308



LONG SECTION

PHASE 2


PROCESSING KITCHEN
BROADWAY ST
WATER ST
B
B'
C'
-5
-15
-40
-40
PROCESSING
RETAIL
FERRY
MARKET&EVENTS
1.8 mi 36 min

25%
INCREASE IN FARMER PRODUCTION

1,000
JOBS CREATED

27%
DECREASE IN TRANSPORTATION COSTS

8
SHIPS/ WEEK

40,000 TONS
PROCESSING CAPACITY PER YEAR

PHASE 1
AXONOMETRIC VIEW

PERMEABILITY

INTEGRATION

TRANSPARENCY

SECTION A-A'

LOADING/ UNLOADING

SHED

TRADING AREA

LONG TERM STORAGE

COLD STORAGE

WORKERS LOUNGE

PEDESTRIAN WALKWAY

VIEW FROM DOCKS

VIEW FROM WALKWAY IN PROCESSING BUILDINGS

DENSITY

ORIENTATION

SECTION B-B'

RAILWAYS

PEDESTRIAN CONNECTION TO NEWBURGH

LOADING/ OFFLOADING AREA

PROCESSING KITCHEN

PUBLIC-PRIVATE INTERFACE

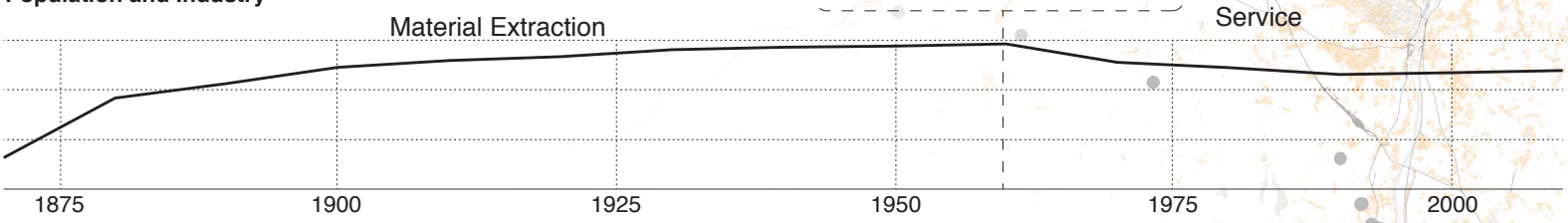
BREWERY

CITY WATER-FRONT TRAIL

HUDSON RIVER

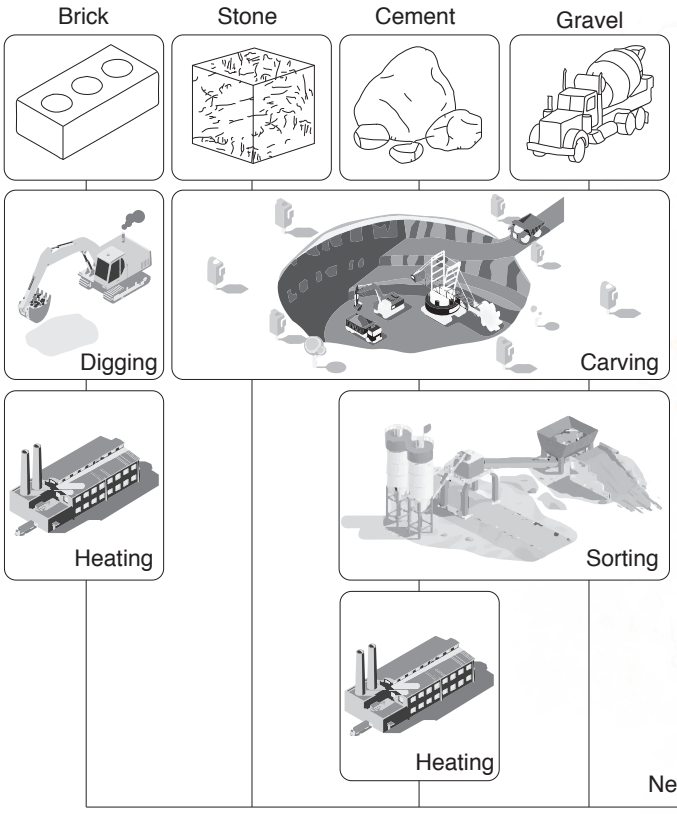
Hudson River Valley Building Industry

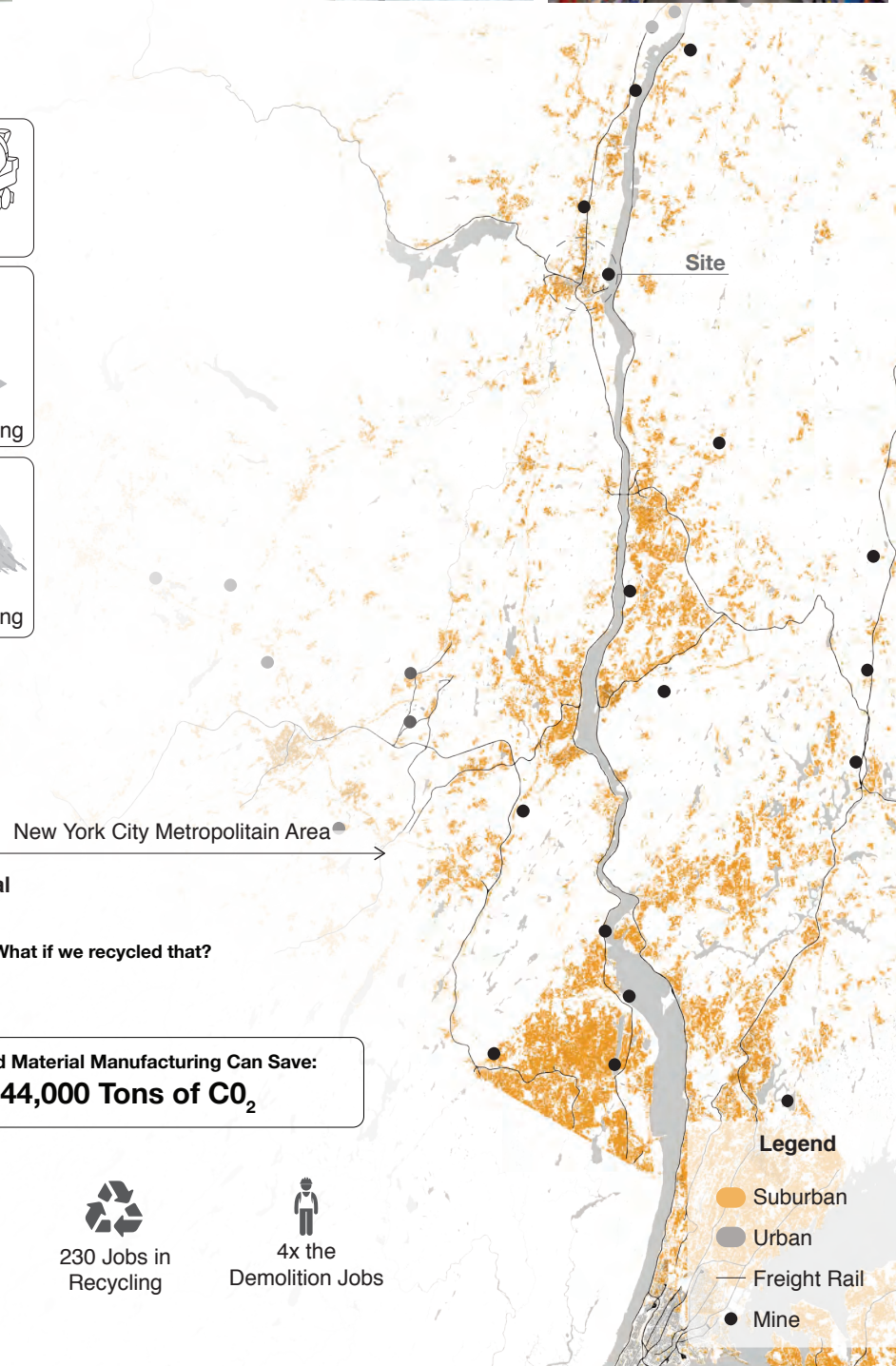
Population and Industry





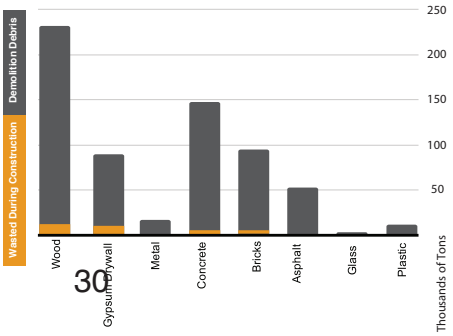

Local Extracted Materials





State Waste and Recycled Material Manufacturing Potential

Construction and Demolition Waste
970,000 Tons of Waste



What if we recycled that?

Recycled Material Manufacturing Can Save:
844,000 Tons of $C0_2$

600 Jobs in Production

230 Jobs in Recycling

4x the Demolition Jobs

Legend
- Suburban
- Urban
- Freight Rail
- Mine

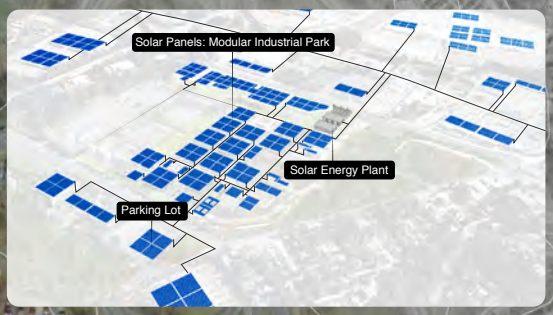
The Tech City Co-Op

Victoria Vuono, Laszlo Kovacs, Sophie Lee, Ritchie Ju

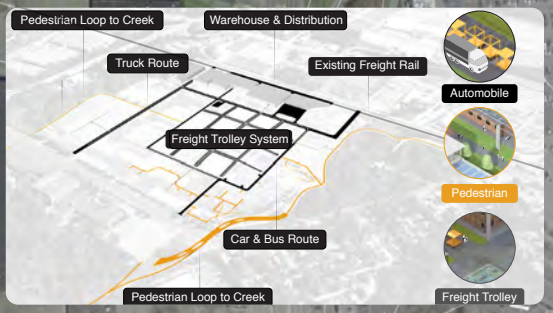
The building industry in the United States accounts for 30% of global carbon emissions, with 40% associated with construction and 60% with the operations and energy consumption of buildings. The Green New Deal calls for the country's building stock to be upgraded to reduce emissions but we also need to ask how the production of building materials can become less carbon intensive? The Hudson River Valley has a long history of building material production utilizing local resources, yet, in recent years, these industries have shifted abroad, dramatically increasing carbon intensive building processes.

TECH CITY CO-OP is a building material production facility that uses recycled materials collected from the region. Using new technologies as well as a cooperative labor and production organization, the project facilitates symbiotic building-industry relationships to reshape regional construction and to lower carbon emissions in the region.

See the project's video here
https://vimeo.com/380161031



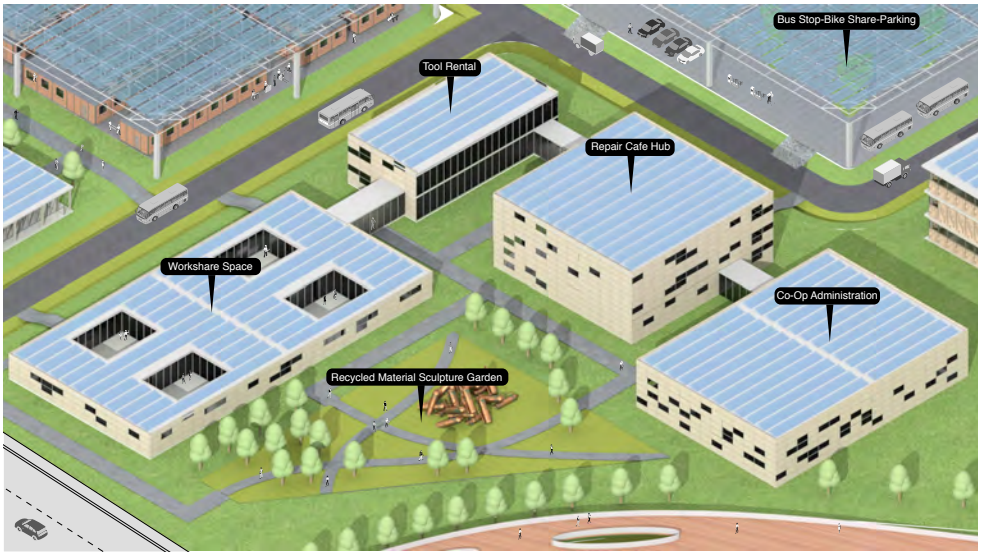
Solar Power Network



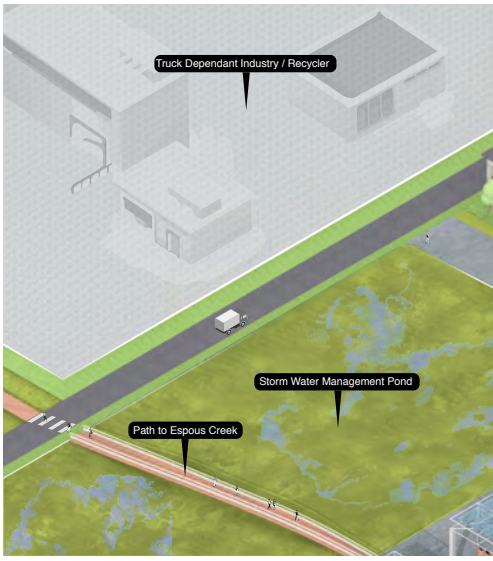
Circulation Network

Storm Water Network

Industrial Network

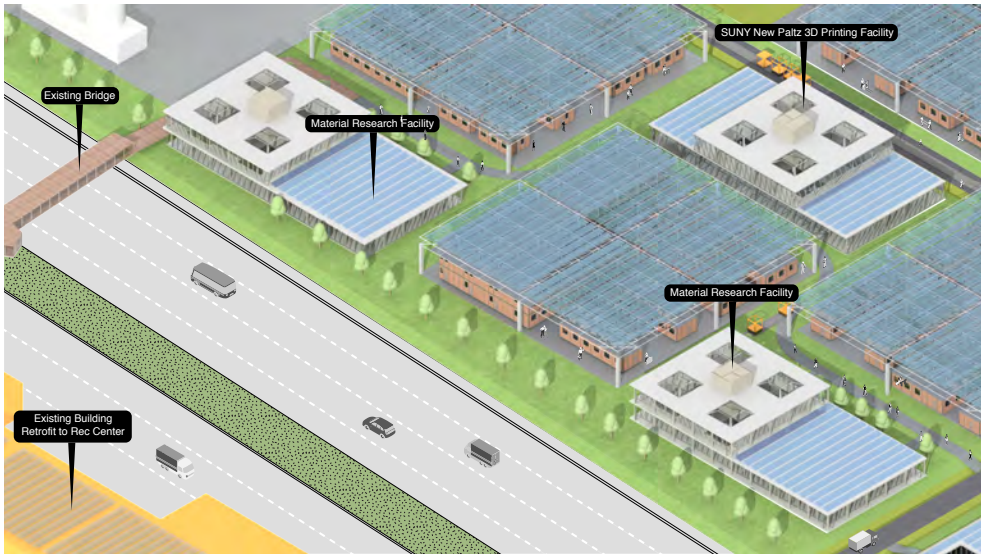


3. Administration and Support

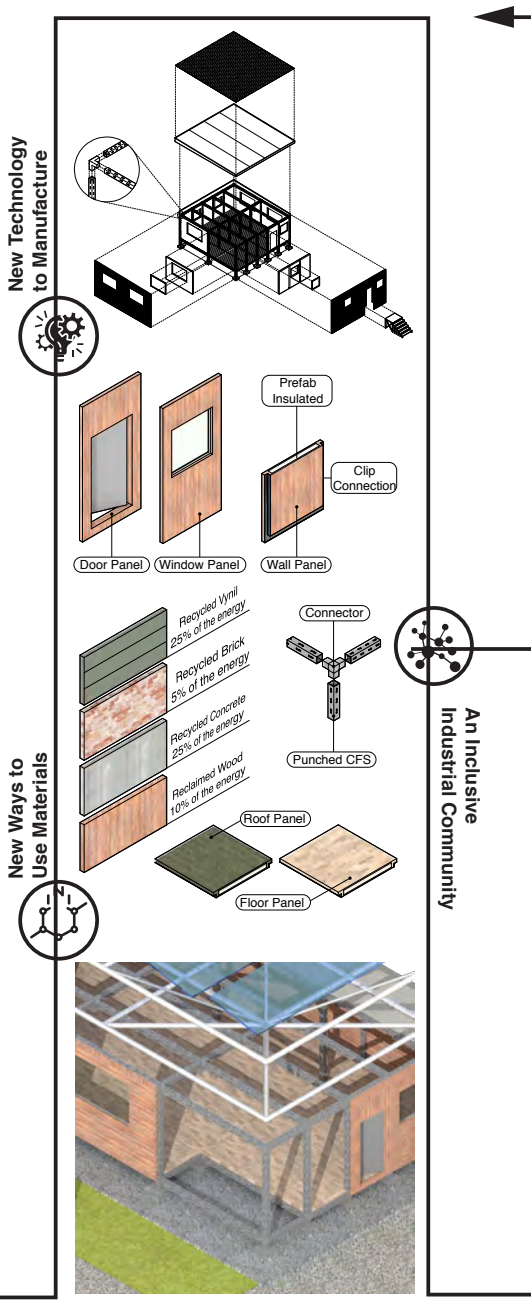


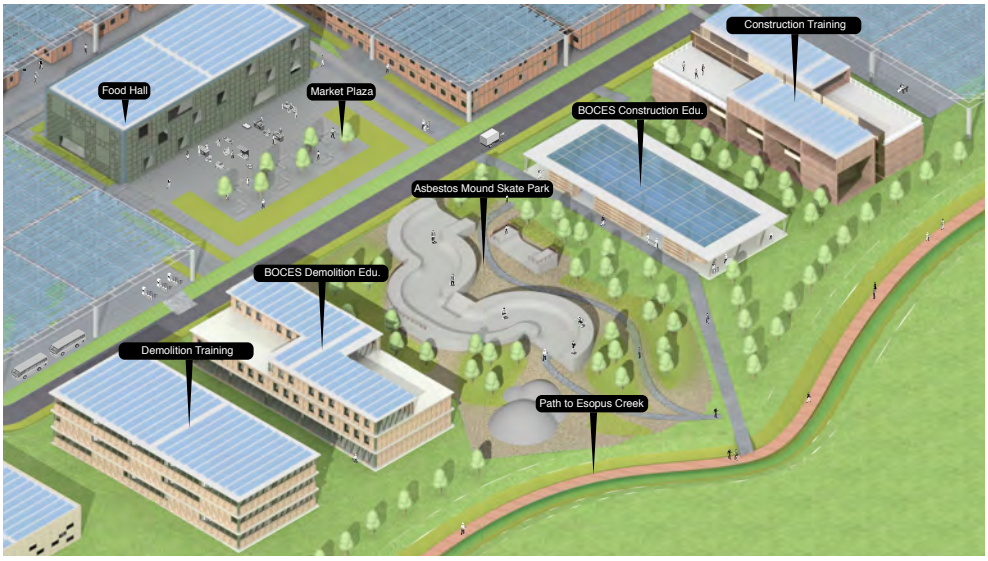
4. Kiln and Water Treatment

2. Tech Incubator



1. Material Research Center





5. Education Training

Utilizing Fright Rail

Utilizing Solar Energy

Utilizing Grey Water

Training the Next Generation of Builders

View Near BOCES Training Center

Kiln and Water Treatment

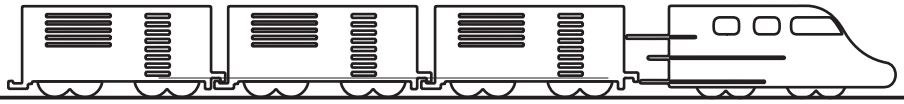
Consoledated Transportation

On Site Material Sourcing

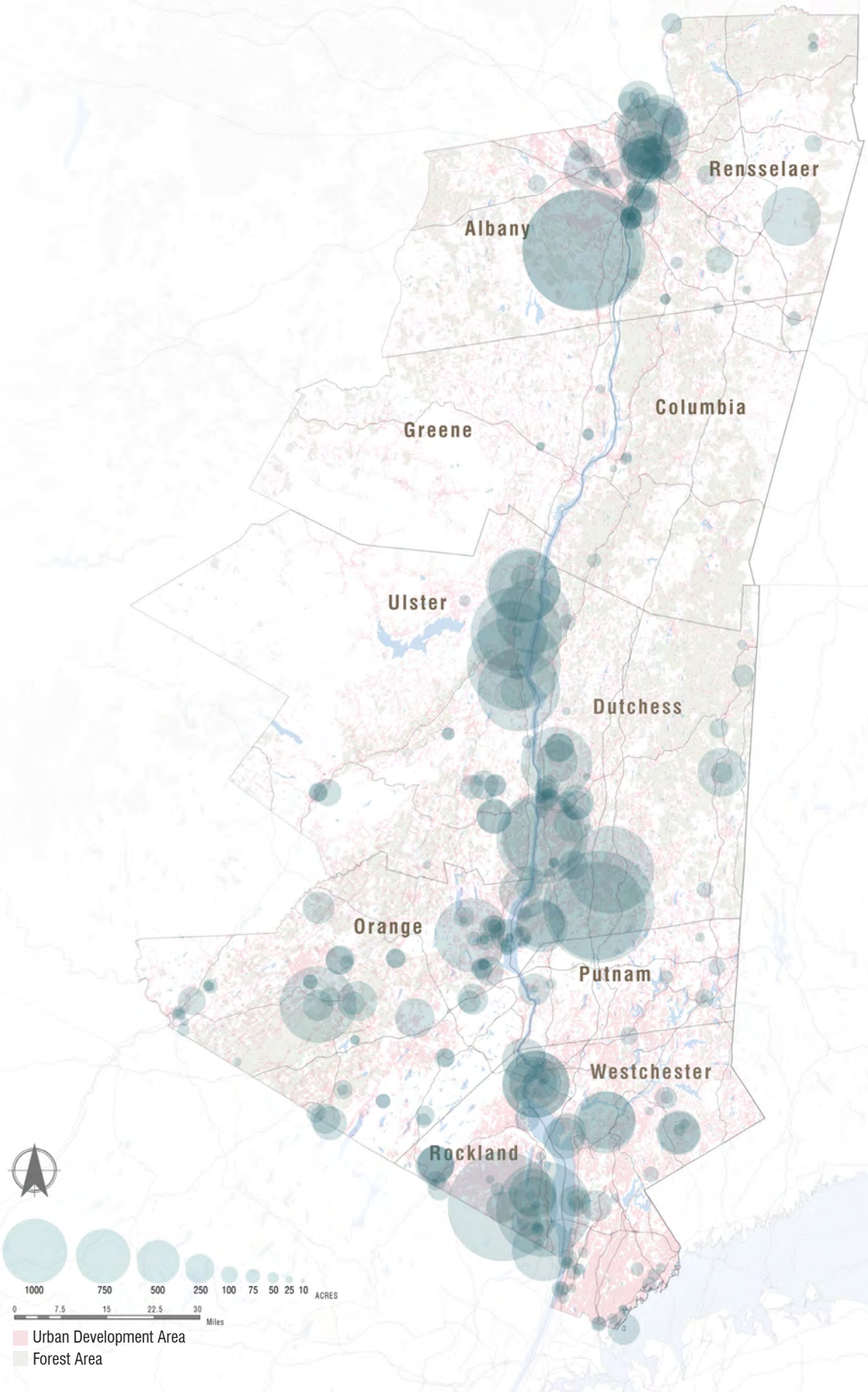
Encouraging Closed Loop Maufacturing

Collaboration with Various Industries

High Quality Building Materials



Contaminated Sites in the Hudson Valley



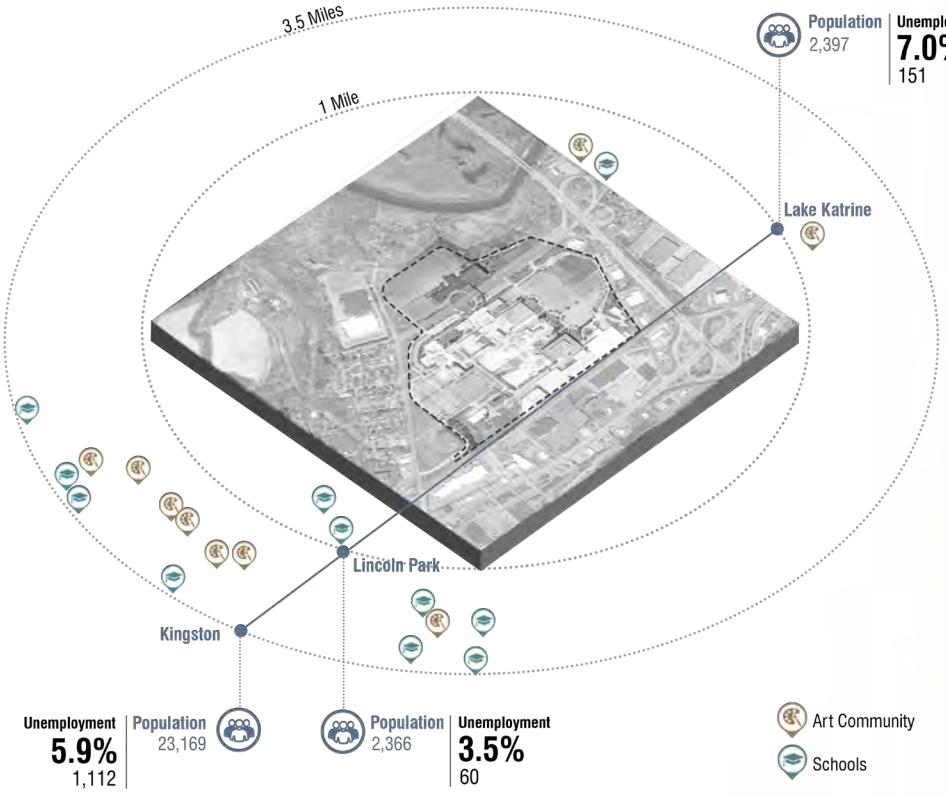
Green it, Clean it!

Anai Perez, Danwei Pan, Pratibha Singh, Zixuan Zhang

About 130,000 acres of Hudson Valley land has been directly or indirectly contaminated by industry. GREEN IT, CLEAN IT transforms these brownfields into community assets that can tackle pollution and improve soil health, sequester carbon and restore land productivity.

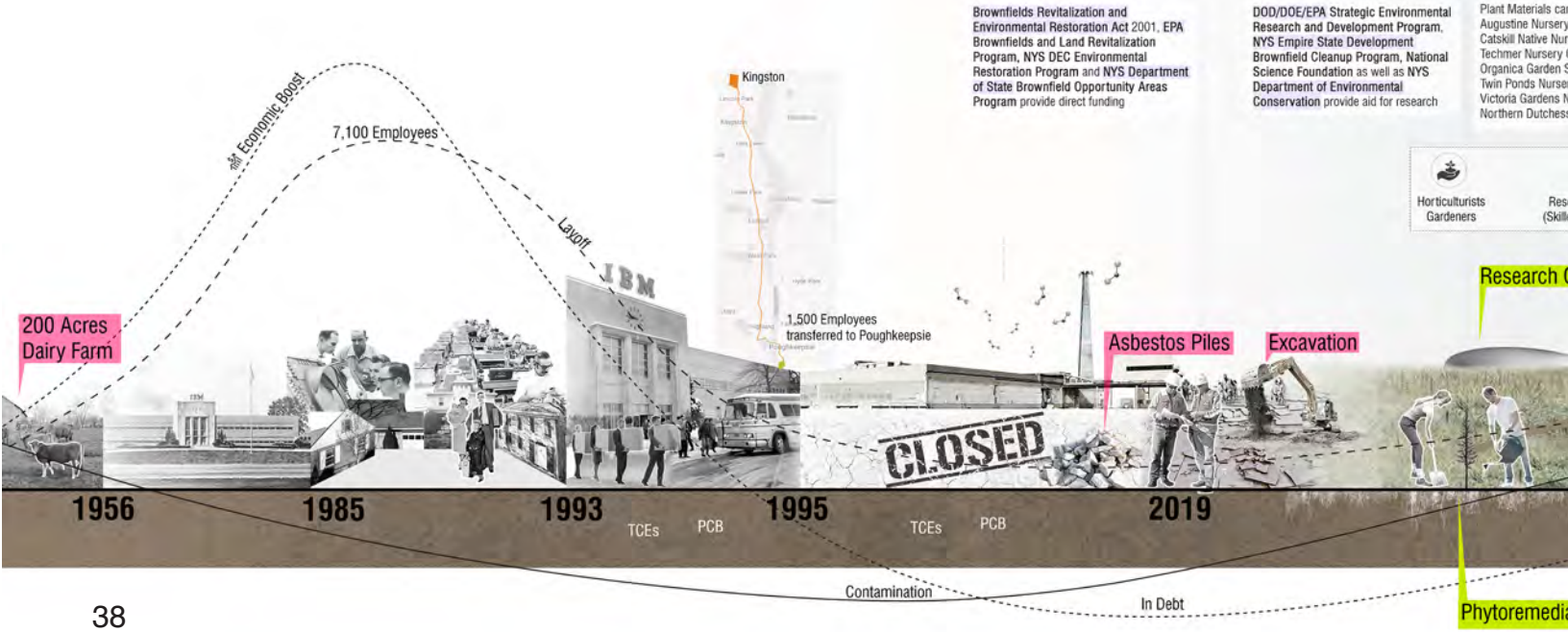
The abandoned and hazardous Tech City (former IBM) in Kingston is a test site of remediation using nature-based systems. The process of change enables us to open the site to adjacent communities and ecologies, and provides recreational and economic benefits locally and regionally. Site programing generates a range of jobs in research, manufacturing and maintenance, ensuring communities of all types have access to work and a strengthened local economy. Sites such as Tech City can become places for research and education about new infrastructures of remediation.

See the project's video here:
https://vimeo.com/380158487



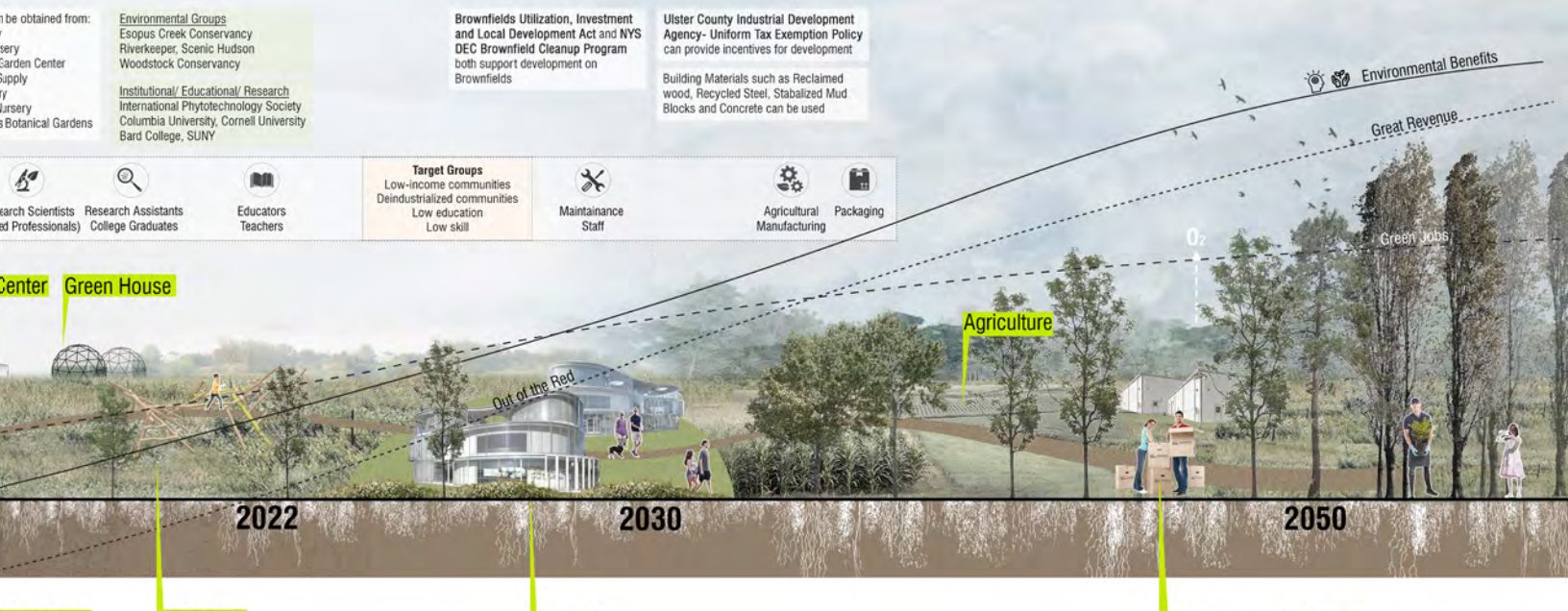
Property Area: 258 Acres
Demolished Area: 19 Acres
Industrial Parcel: 20 Acres
Data center/ Industrial Parcel: 16 Acres
Mixed Use Parcel: 10 Acres
Parking Parcel: 39 Acres
Office Parcel: 3 Acres

IBM
Access Point
Highway
Road

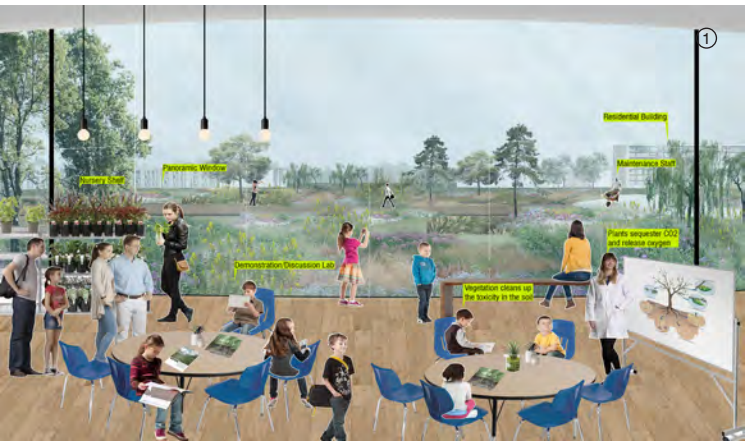



40
Acres
Plume Area
TCEs
Trichloroethane,
Trichloroethylene
PCE
Perchloroethylene

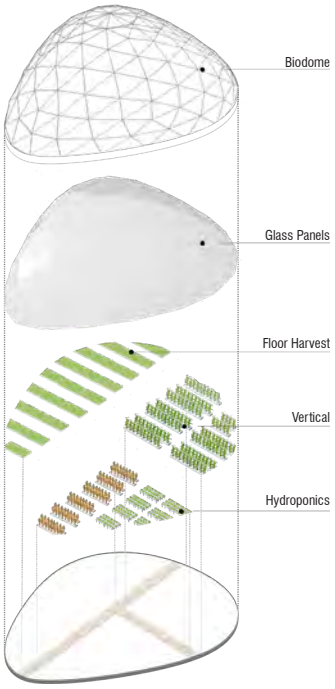

Armature Space
Research Center
City Living Room
Sport Field & Playground
Incubators & Maker Spaces
Green Houses
Manufacturing
Affordable Housing


be obtained from:
sery
Garden Center
Supply
ry
Nursery
Botanical Gardens
Environmental Groups
Esopus Creek Conservancy
Riverkeeper, Scenic Hudson
Woodstock Conservancy
Institutional/ Educational/ Research
International Phytotechnology Society
Columbia University, Cornell University
Bard College, SUNY
Brownfields Utilization, Investment and Local Development Act and NYS DEC Brownfield Cleanup Program both support development on Brownfields
Ulster County Industrial Development Agency- Uniform Tax Exemption Policy can provide incentives for development
Building Materials such as Reclaimed wood, Recycled Steel, Stabalized Mud Blocks and Concrete can be used
earch Scientists
ed Professionals)
Research Assistants
College Graduates
Educators
Teachers
Target Groups
Low-income communities
Deindustrialized communities
Low education
Low skill
Maintainance
Staff
Agricultural
Manufacturing
Packaging
Environmental Benefits
Great Revenue
Green Jobs
Center
Green House
Agriculture
Out of the Red
2022
2030
2050
ation Begin
Recreation
Housing
Food Processing Center


LEGEND
1 - Research Center
2 - Phytoremediation Garden
3 - Winter Garden
4 - Pollinator Garden
5 - Greenhouse
6 - Farm to Table Copackers
7 - Food Processing Center
8 - Indoor soccer fields
9 - Affordable Housing
10 - Incubators
11 - Playfields
12 - Playground
13 - Trail
N

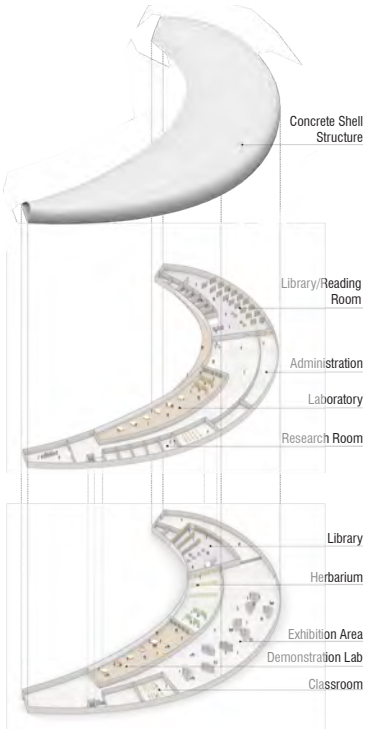


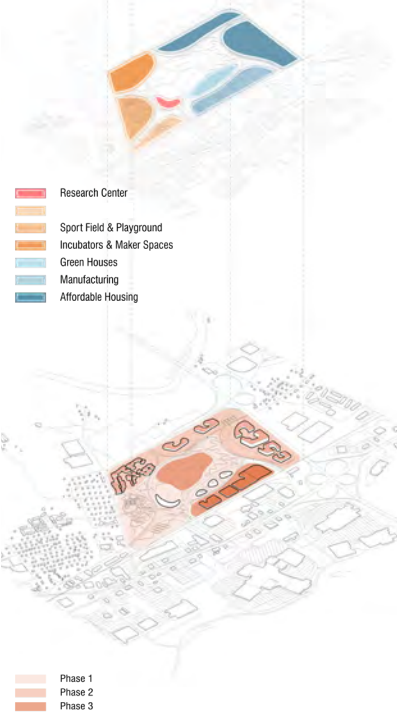
Green House

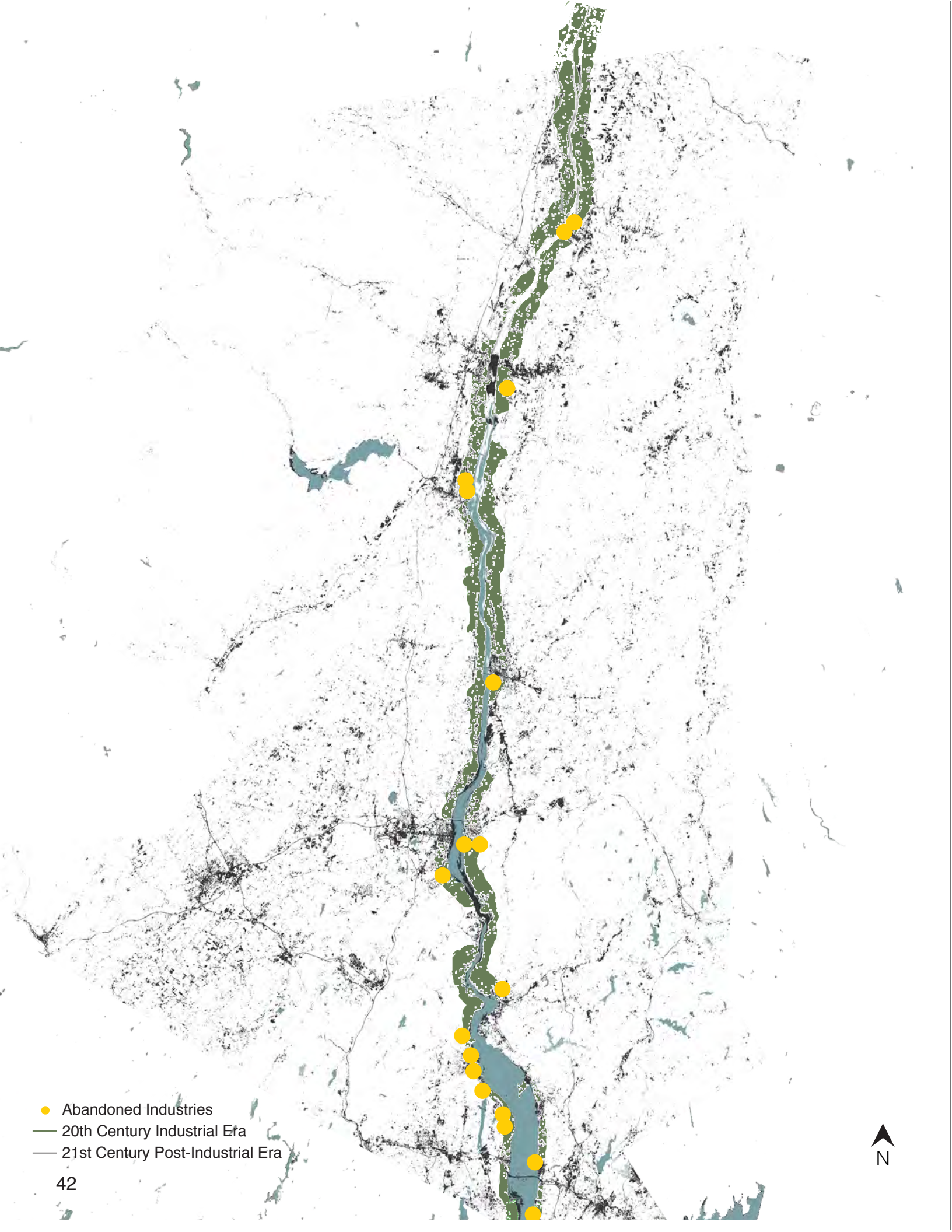


System Axonometric

Research Center





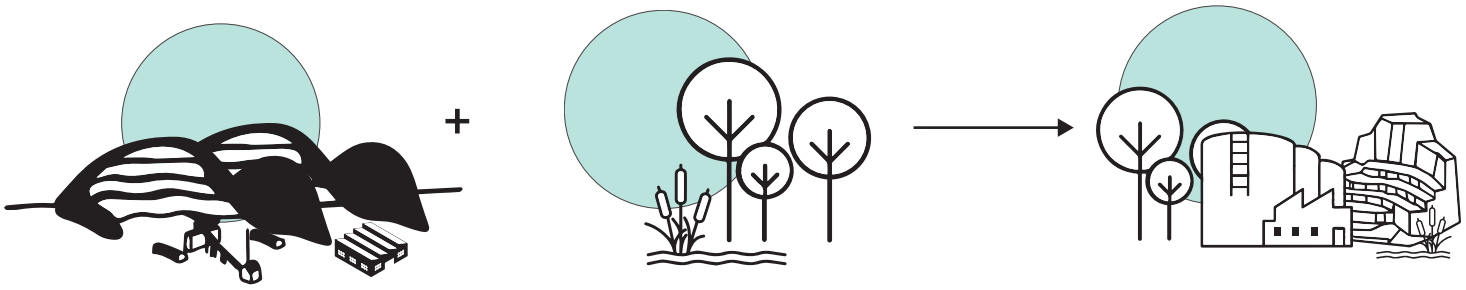

Abandoned Industries
20th Century Industrial Era
21st Century Post-Industrial Era
N

QuarryScape

Zhou Wu, Palvasha Sophia Khan, Nikita K, Ashwin Nambiar

For more than a century, industries along the Hudson River thrived, producing goods and employing many residents but, at the same time, polluting the environment. Extensive swaths of forests, meadows, wetlands and watersheds were contaminated and destroyed. Since the 1970s, the Valley's many industries were abandoned, scarring the landscape and often blocking waterfront access in cities and towns all along the River. QUARRYSCAPE uses an abandoned quarry in Kingston to test new forms of energy production and to turn scarred landscapes into recreational sites for community well-being. Can industries and nature co-exist?

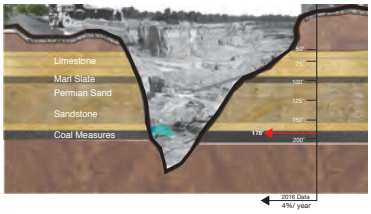
See the project's video here:
https://vimeo.com/380157237



PHASING AND TIMELINE OF THE QUARRY REVITALIZATION

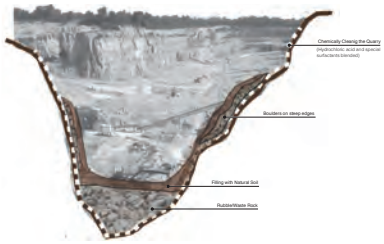
2019

1.Existing Condition and Capacity



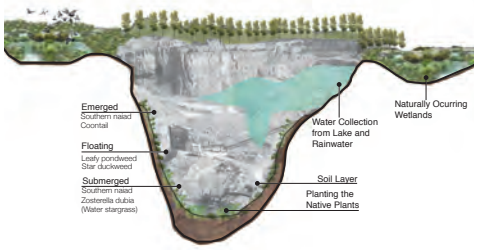
2023

2.Cleaning the Quarry



2025

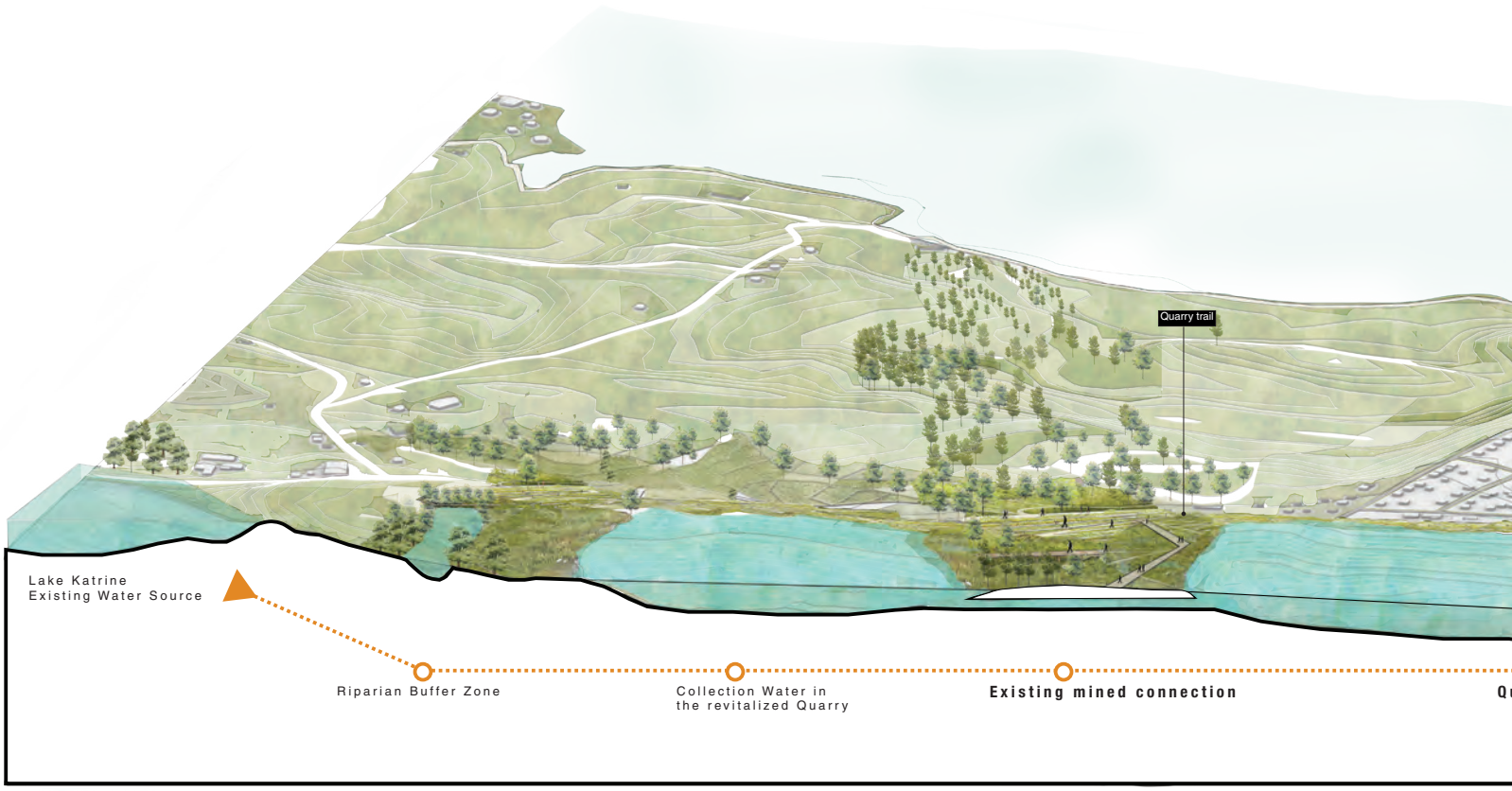
3.Restoration/Adding of damaged Ecology and Habitats



2026

4.Quarry Revitalized and ready t able energy

SITE WATER AND ECOLOGY SYSTEM



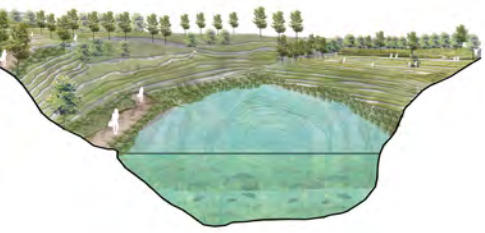
WETLAND AROUND QUARRY

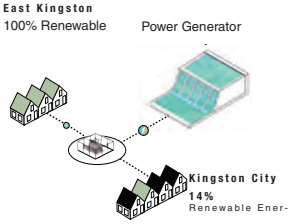
VIEW FROM INSIDE HYDROELECTRIC PLANT (WINTER AND SUMMER)

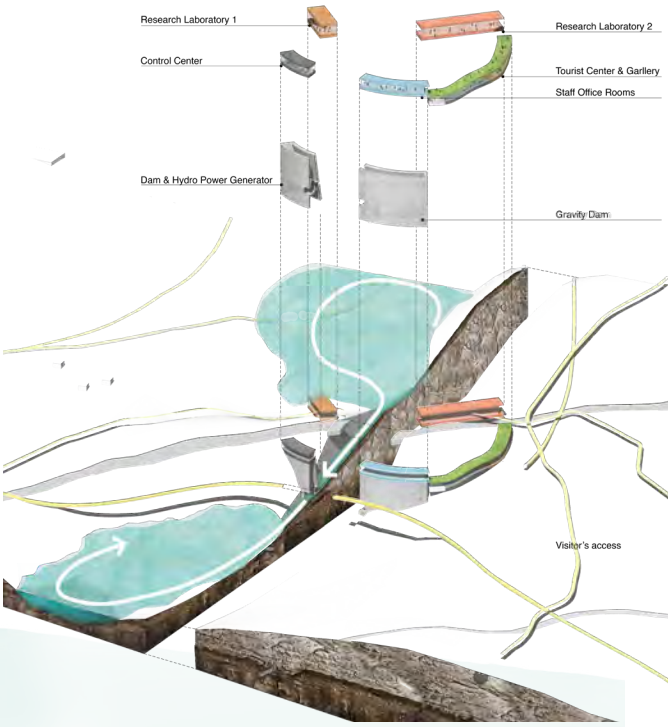
C T I V E

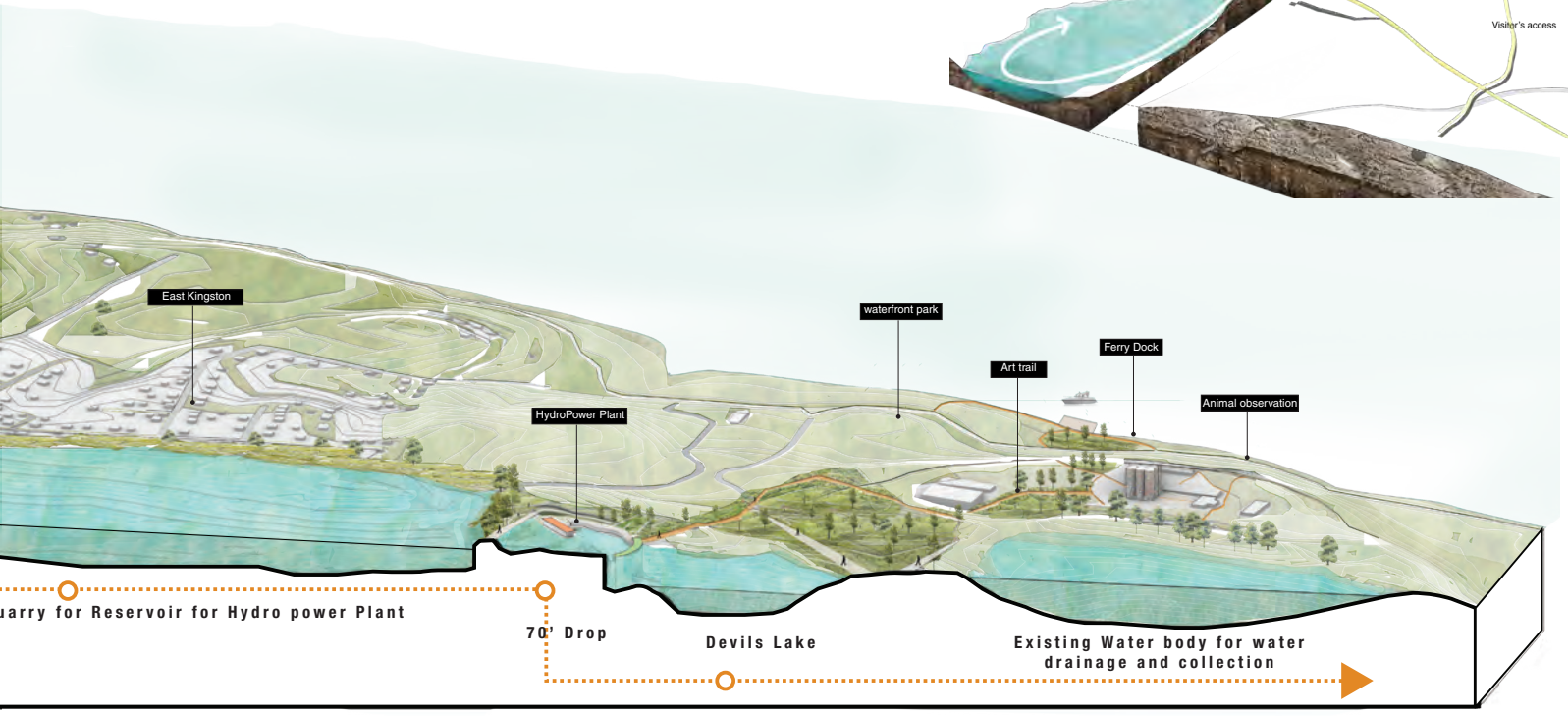
HYDROPOWER PLANT DETAILS

to use for water storage for renew-

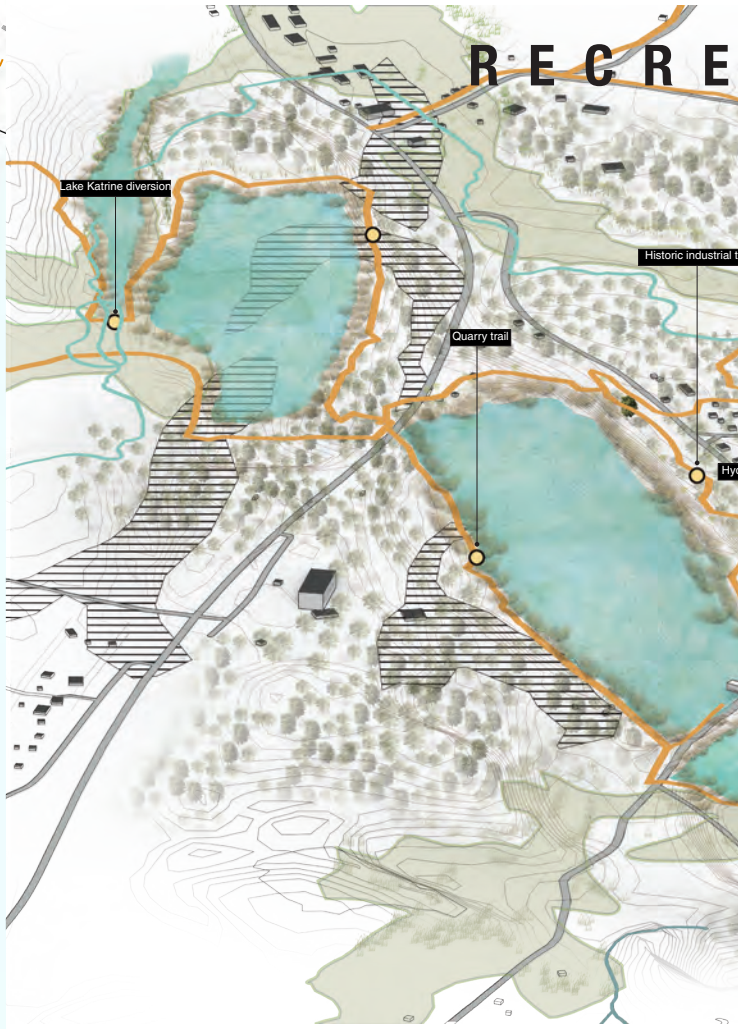




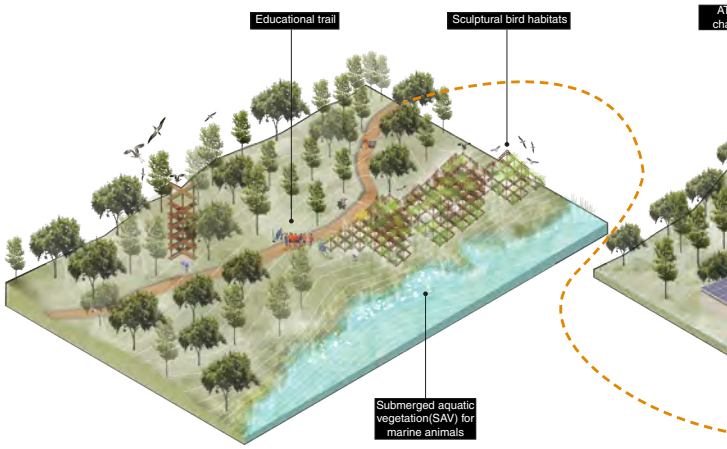




REVITALIZATION OF THE QUARRY



PROPOSED RECREATIONAL TRAILS/ACTIVITIES

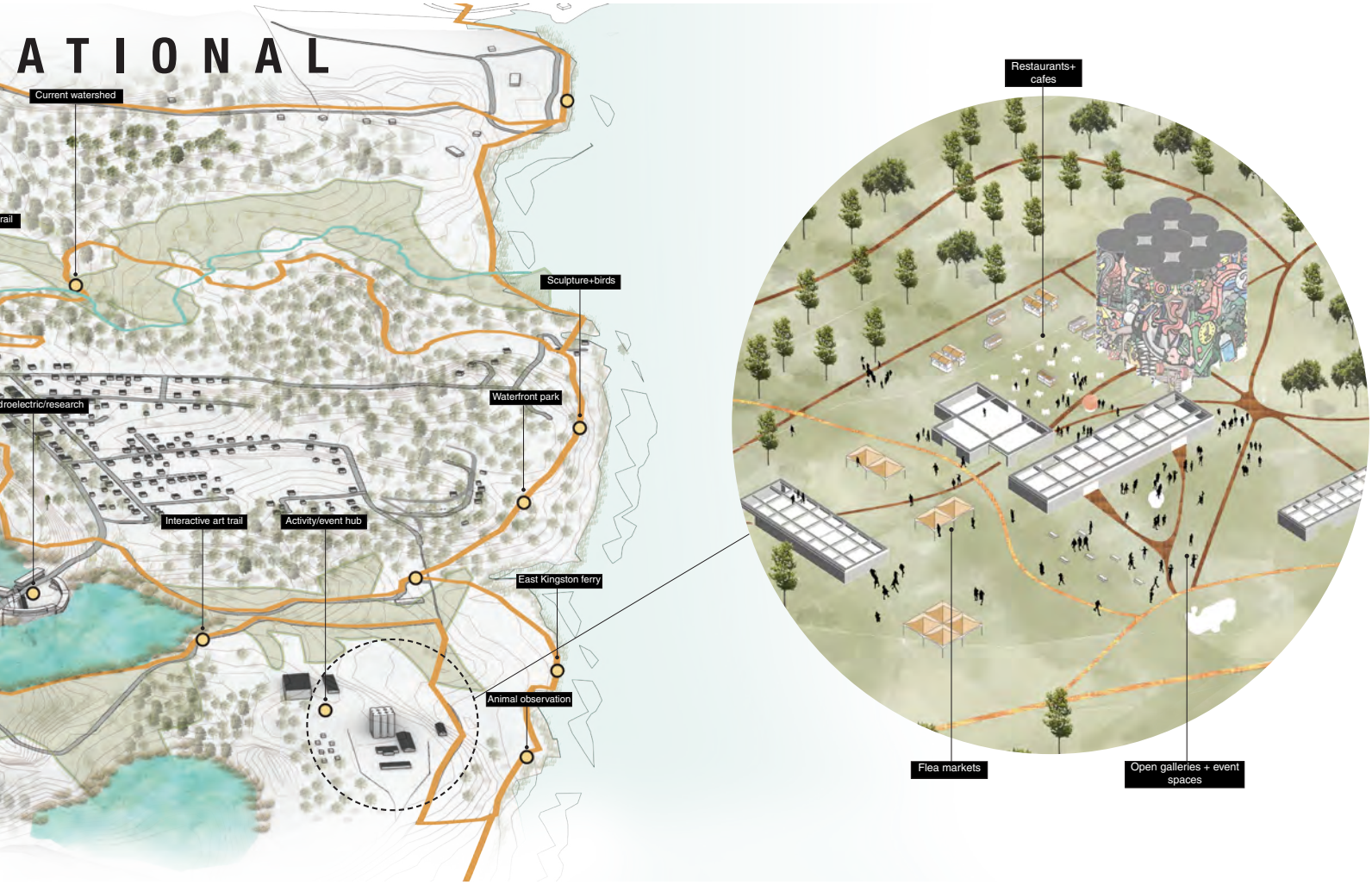


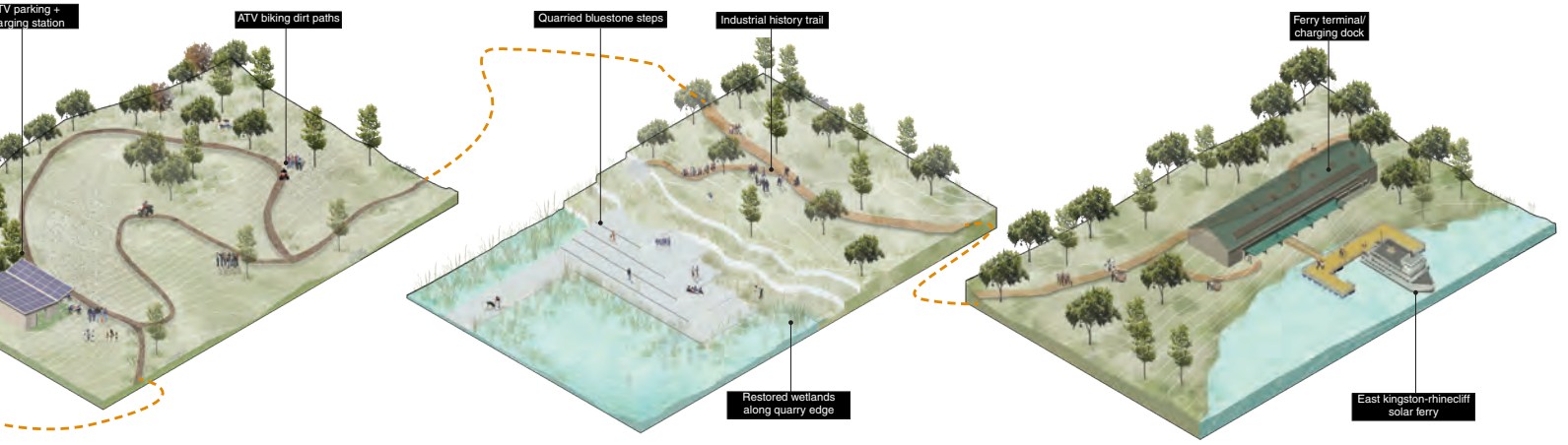
BIRDS/ANIMALS HABITAT TRAIL

ATV BIKING+

EAST KINGSTON TRAIL

ATIONAL





RACING ZONE

QUARRY EDGE TRAIL

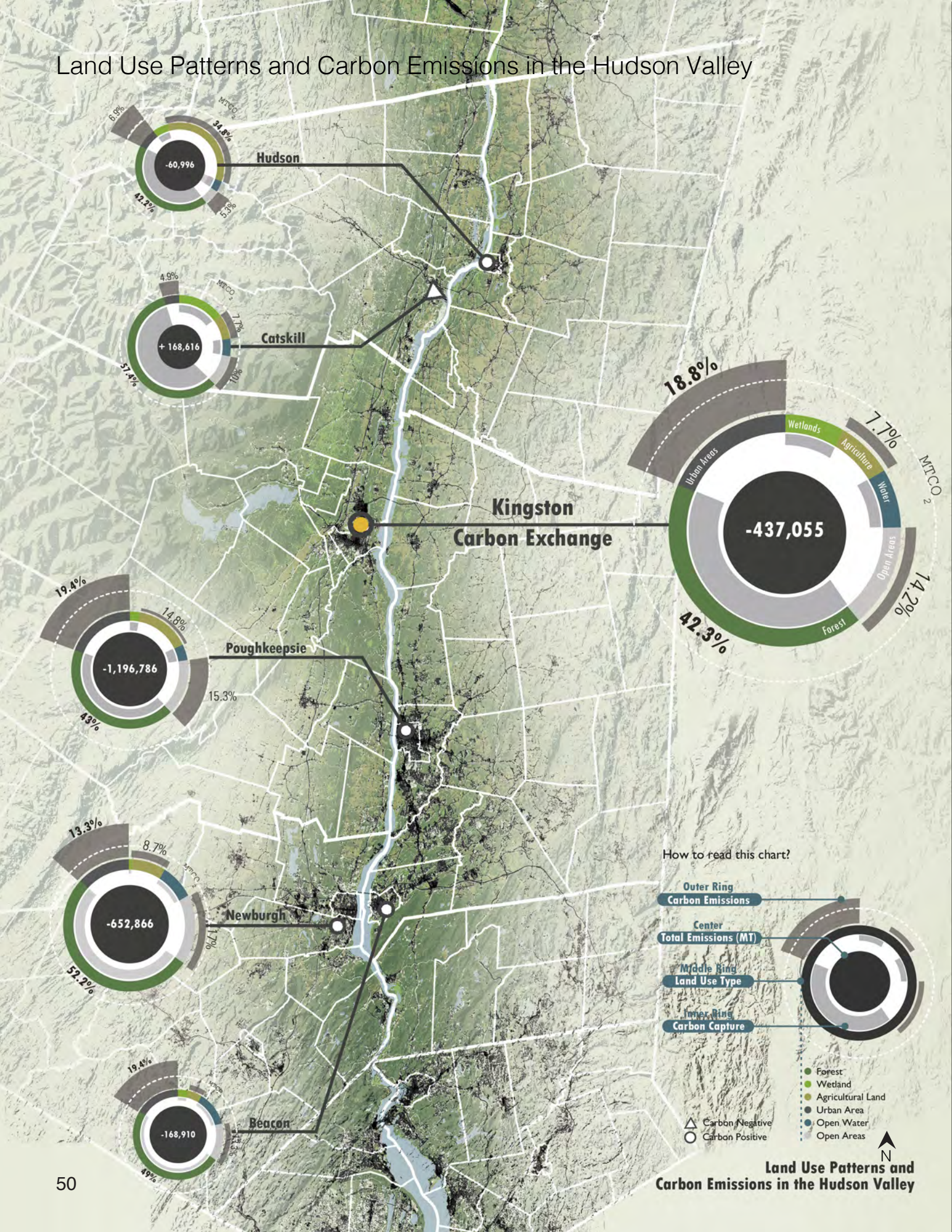
EAST KINGSTON-RHINECLIFF FERRY

FERRY+WATERFRONT PARK

ACTIVITY HUB

URBAN FABRIC


702 D
NEW YORKERS
FOR
CLEAN POWER
Renewable
Energy
Now
GARBAGE
ONLY


Hudson
-60,996
6.9%
34.8%
42.2%
5.3%
Catskill
+ 168,616
4.9%
7.7%
57.4%
10%
Kingston
Carbon Exchange
-437,055
18.8%
7.7%
14.2%
42.3%
Wetlands
Agriculture
Water
Open Areas
Forest
Urban Areas
Poughkeepsie
-1,196,786
19.4%
14.8%
15.3%
43%
Newburgh
-652,866
13.3%
8.7%
17%
52.2%
Beacon
-168,910
19.4%
49%
How to read this chart?
Outer Ring
Carbon Emissions
Center
Total Emissions (MT)
Middle Ring
Land Use Type
Inner Ring
Carbon Capture
Forest
Wetland
Agricultural Land
Urban Area
Open Water
Open Areas
Carbon Negative
Carbon Positive
N
Land Use Patterns and
Carbon Emissions in the Hudson Valley

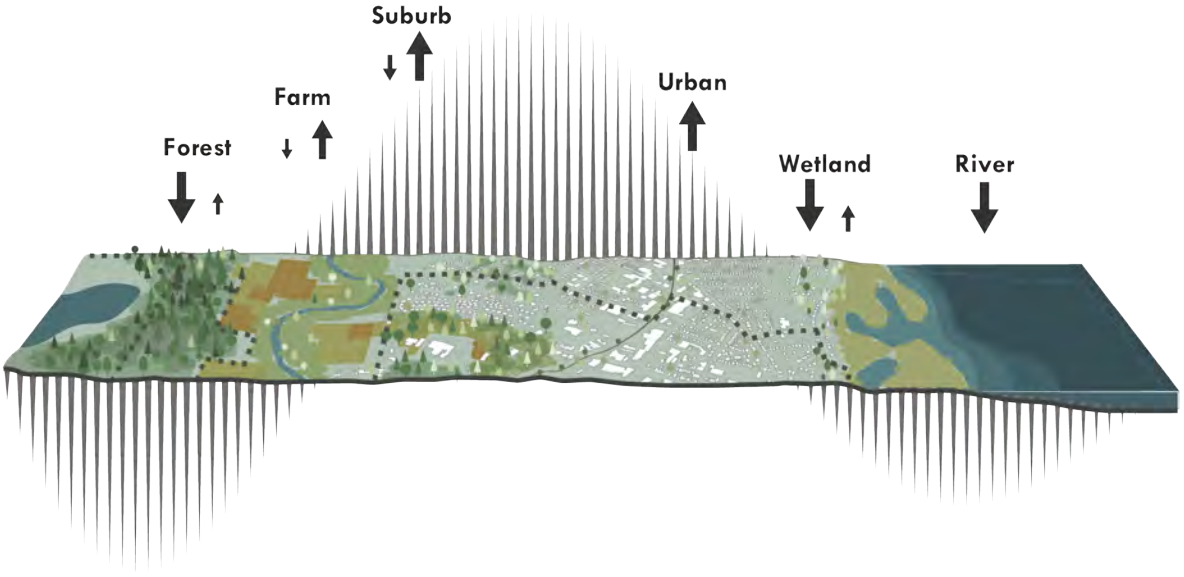
Social Carbon

You-Chiao Wu, Mary Elizabeth Allen, Minjung Lee, Candelaria Mas Pohmajevic

As it stands, the Green New Deal lacks specific methods and tools to implement its grand objectives. How do remedies and prescriptions hit the ground and, equally important, how does implementation prevent the inequalities seen in the Depression-era New Deal?

SOCIAL CARBON is a coordinated set of strategies and projects that prioritize community and environmental needs in Kingston, framing carbon reduction as an integral part of the social life of the Valley. The project utilizes an expanded transect method to visualize and examine conditions, jurisdictions and opportunities. For the Kingston region, we demonstrate how projects of varied scales, with different stakeholders, and with multiple technical needs can be brought together via urban design thinking. We rethink the Green New Deal as a middle ground, neither top-down nor bottom-up, that motivates partnerships across communities and disciplines

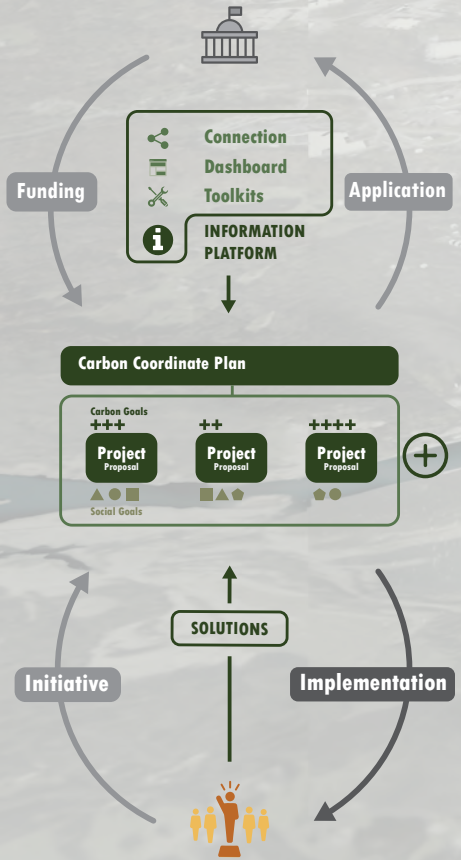
See the project's video here:
https://vimeo.com/380163043

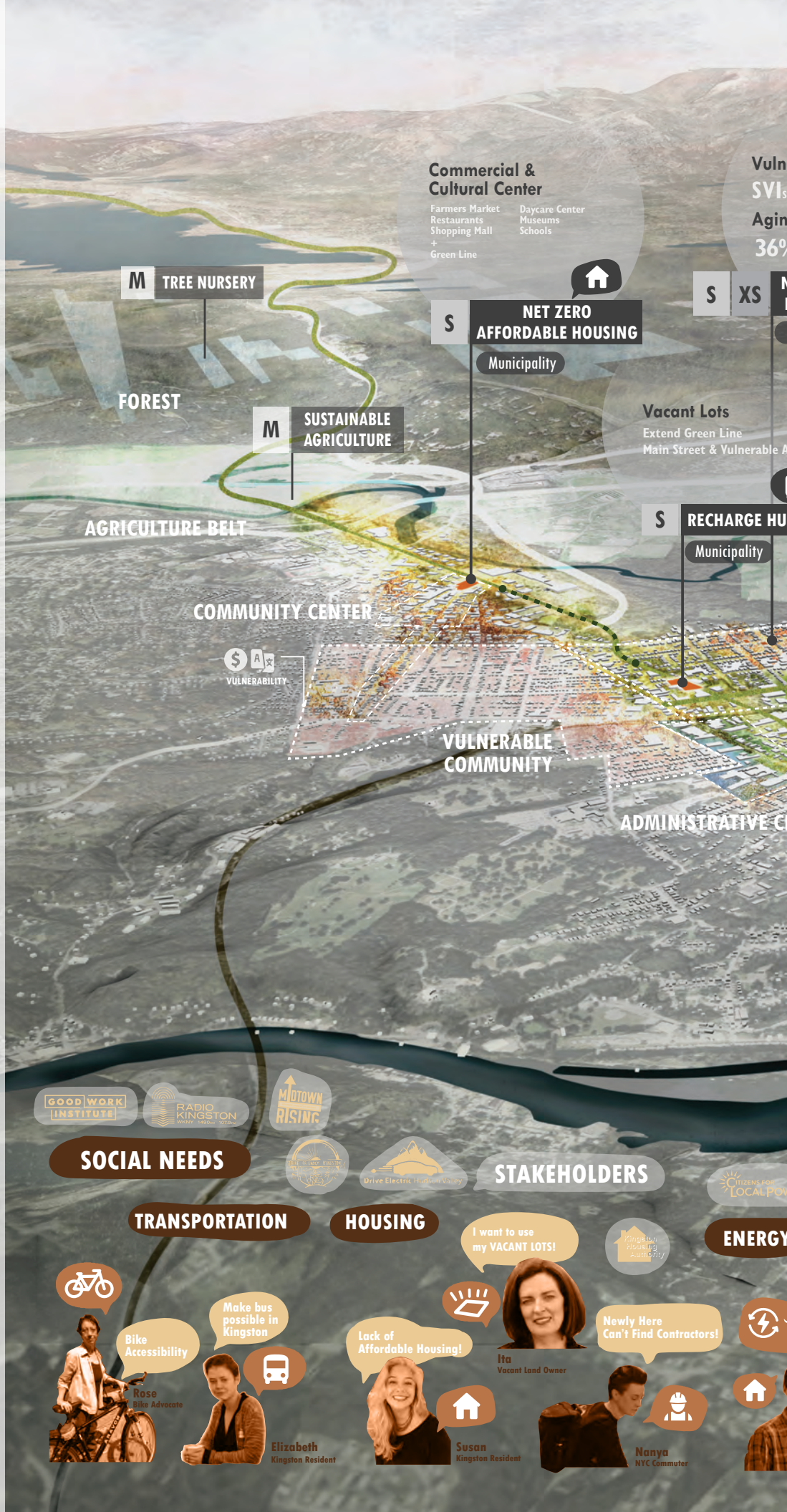


SOCIAL CARBON
at Kingston

Social Carbon Initiative

1. Net Zero Districts
2. Collaboration across Political Boundaries
3. Community Led Initiatives






M
SYSTEMATIC CONNECTION
S
AREA COMMUNITY HUB
XS
BLOCK SCALE INTERVENTION
erable Area
ocial Vulnerability Index
g Housing
% >yrs
NEIGHBORHOOD REGENERATION
Pilot Projects
Private Owner
Abandoned Cement Quarry
Scenic Hudson
Wild Species Habitats
Lakes
Woodlands
Wetland waterfront
M
WETLAND GENERATOR
Community Base Organization
VULNERABILITY
VULNERABILITY
M
LINEAR PARK & TRAIL
CURRENT GREEN LINE
GREEN LINE TRAIL
WETLAND PARKS
FARM HUB
KINGSTON LAND TRUST
SCENIC HUDSON
EDUCATION
Share My Knowledge About The Land But How?
After School Program & Volunteers!
Housing Retrofit Guideline
Jopheth
Kingston Resident
Educators / Concerned Parents
"The younger generation needs help to connect with the nature in their backyard."
Peter
Land Owner + Farmer
CARBON EMISSION
Service
Good
Food
Housing
Transportation
6
5
7
11
12
39.5
10,268 Houses
metric tons CO2 equivalent
Transportation Method
75% Drive Alone
Housing Age
36% > 80 years
House Heating Fuel
31% Fuel Oil Kerosene
46% Utility Gas
53

S NET ZERO AFFORDABLE HOUSING

"...providing all people of the United States with affordable, safe, and adequate housing"

S XS NEIGHBORHOOD REGENERATION

"... to create millions of good, high-wage jobs"
"... upgrading all existing buildings"

Community Workshops

CO_2

CO_2

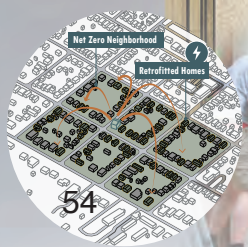
Using Vacant Lots

CO_2

Retrofitting Homes

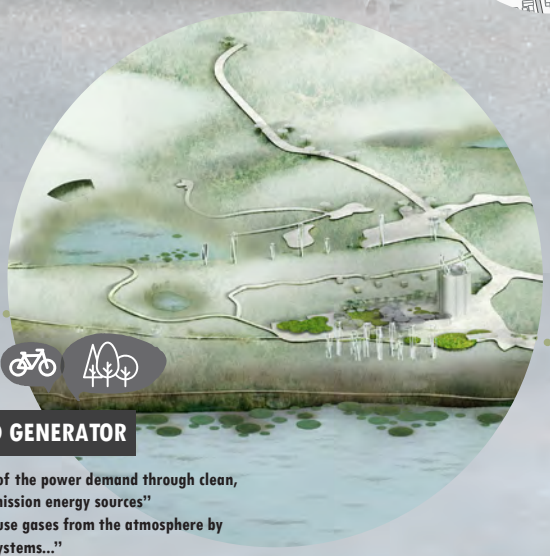
CO_2

Green Jobs



S RECHARGE HUB

"... Overhauling transportation systems in the United States to remove pollution and greenhouse gas emissions from the transportation sector"



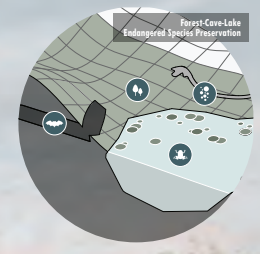
M WETLAND GENERATOR

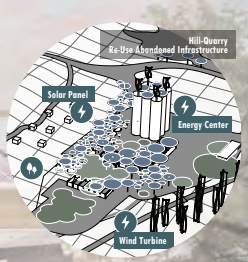
"... meet 100 percent of the power demand through clean, renewable and zero emission energy sources"
"... removing greenhouse gases from the atmosphere by restoring natural ecosystems..."

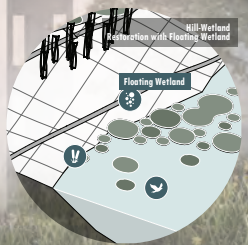
Energy

Using Abandoned Quarry

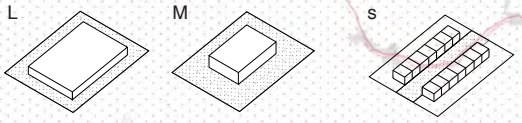
Restoring Wetland







The Dead Retail Infrastructure



Shopping malls
58

'Big Boxes'
317

Street stores
1000+

Dead Malls
Big Boxes
Department Stores

Post Retail Scape – Collaborative Main Street

Chris Zheng, Hatem Alkhathlan, Einat Lubliner, Sushmita Sheker

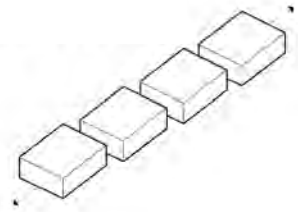
With the global transition from traditional shopping to e-commerce, many Main Streets, Big Boxes and Malls have become redundant. This next phase of commerce has impacted social interaction, local economies, existing infrastructures, and many types of jobs and services. POST RETAIL SCAPE offers a new retail module in the form of a shared collaborative platform through which small businesses share space, energy, resources, waste management and storage. This sharing of assets reduces costs and carbon emissions and also funnels local dollars, promotes interaction, improves jobs and enables great social participation and equity in the remaking of Main Streets.

See the project's video here:
https://vimeo.com/380155358

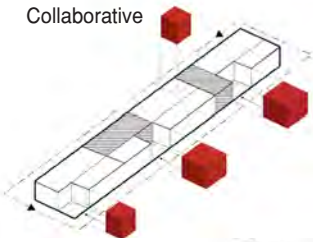
Post Retail Scape

Evolution of Retail

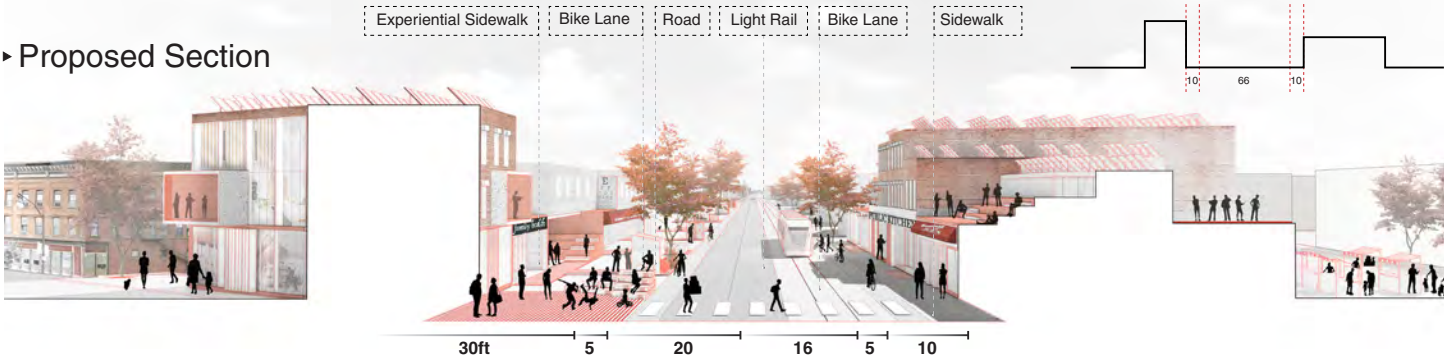
New Model
Individual Retail



Old Model
Collaborative

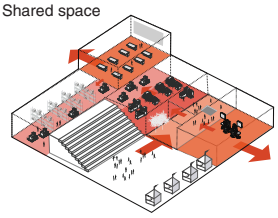


▸Proposed Section

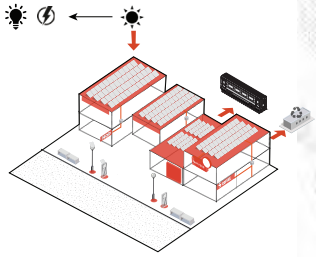


▸Strategies

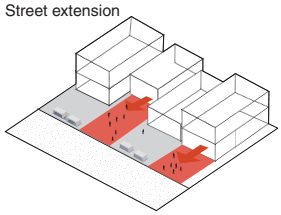
Shared space



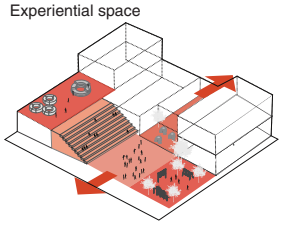
Renewable energy



Street extension



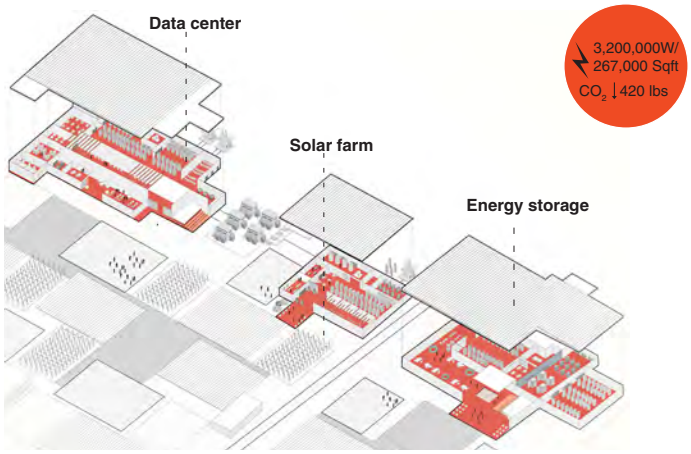
Experiential space



Retail Street | Broadway

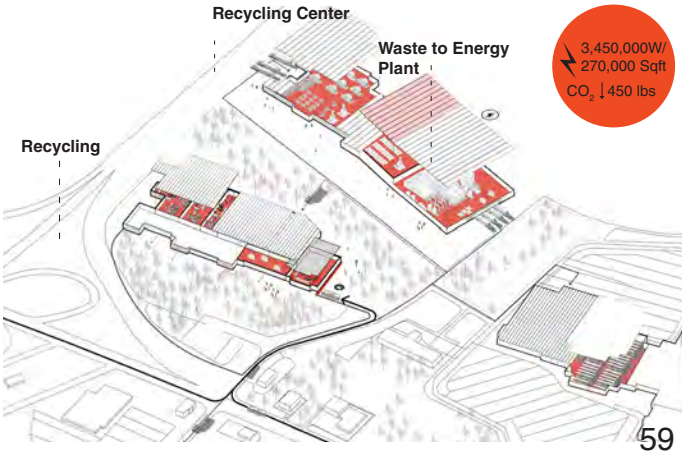
▸M Scale | Renewable Energy Production

Solar Farms & Data Center

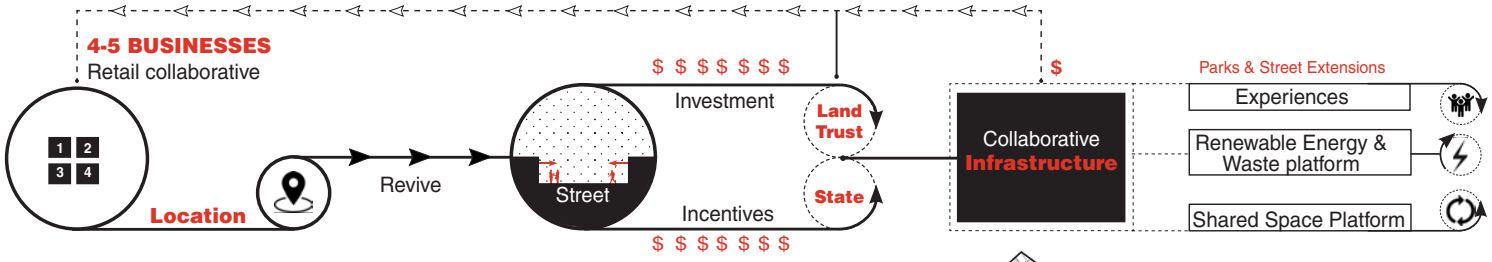


▸L Scale | Recycling and Distribution Center

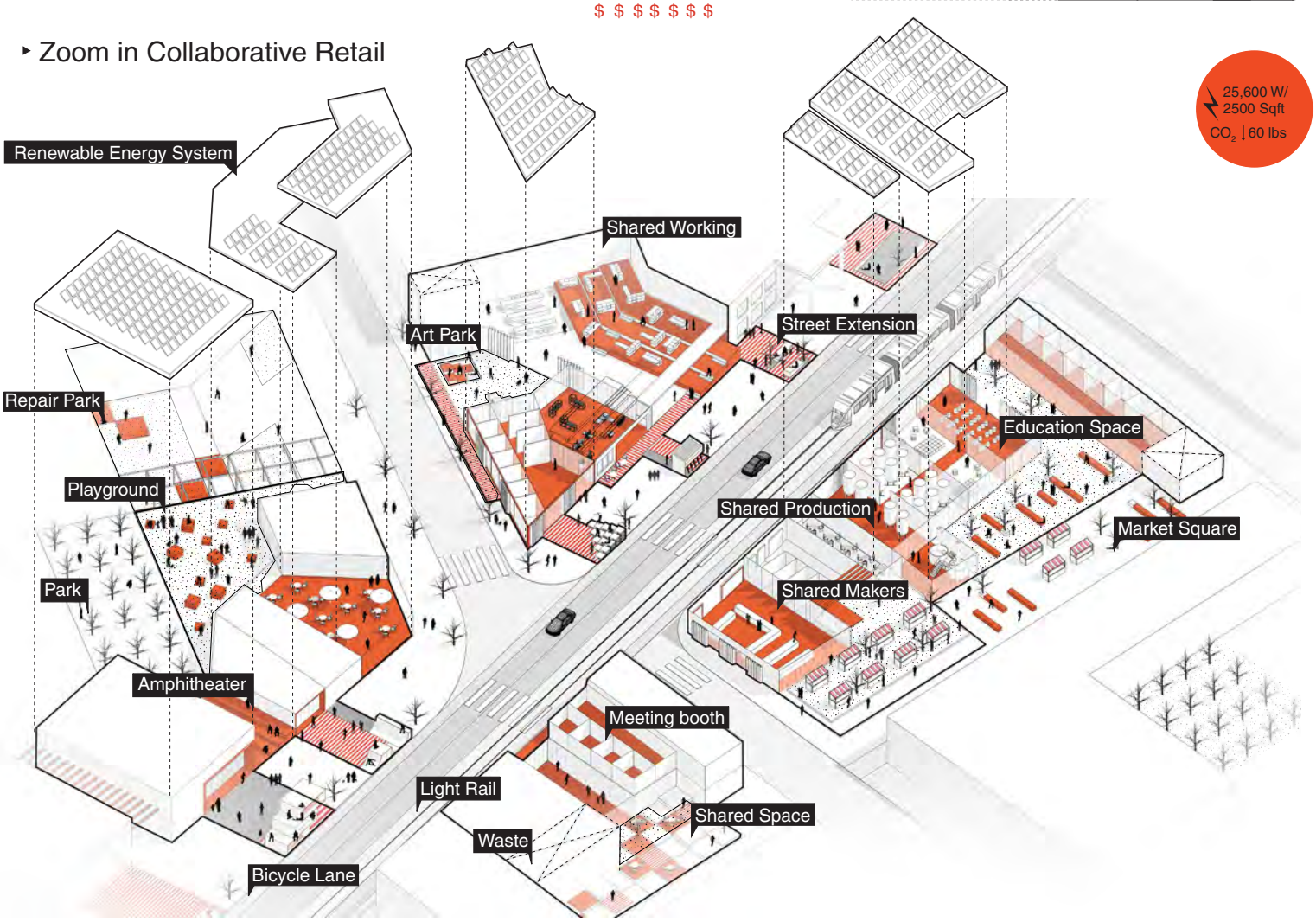
Recycle to Energy Plant & Distribution Center



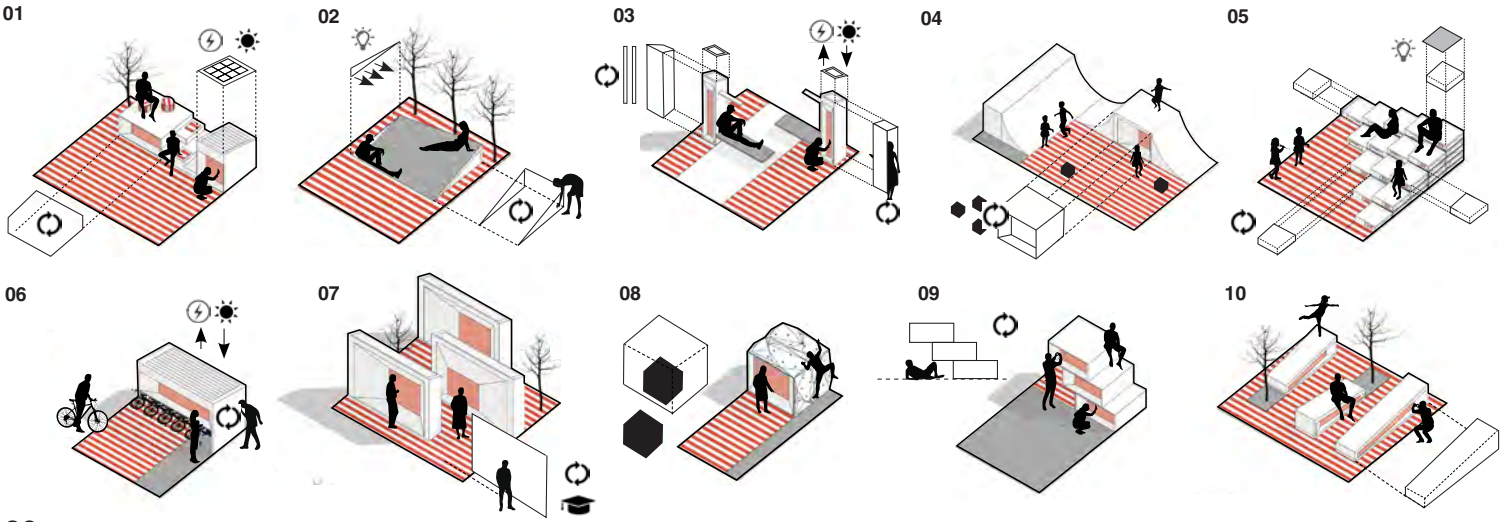
▸ Policy



▸ Zoom in Collaborative Retail



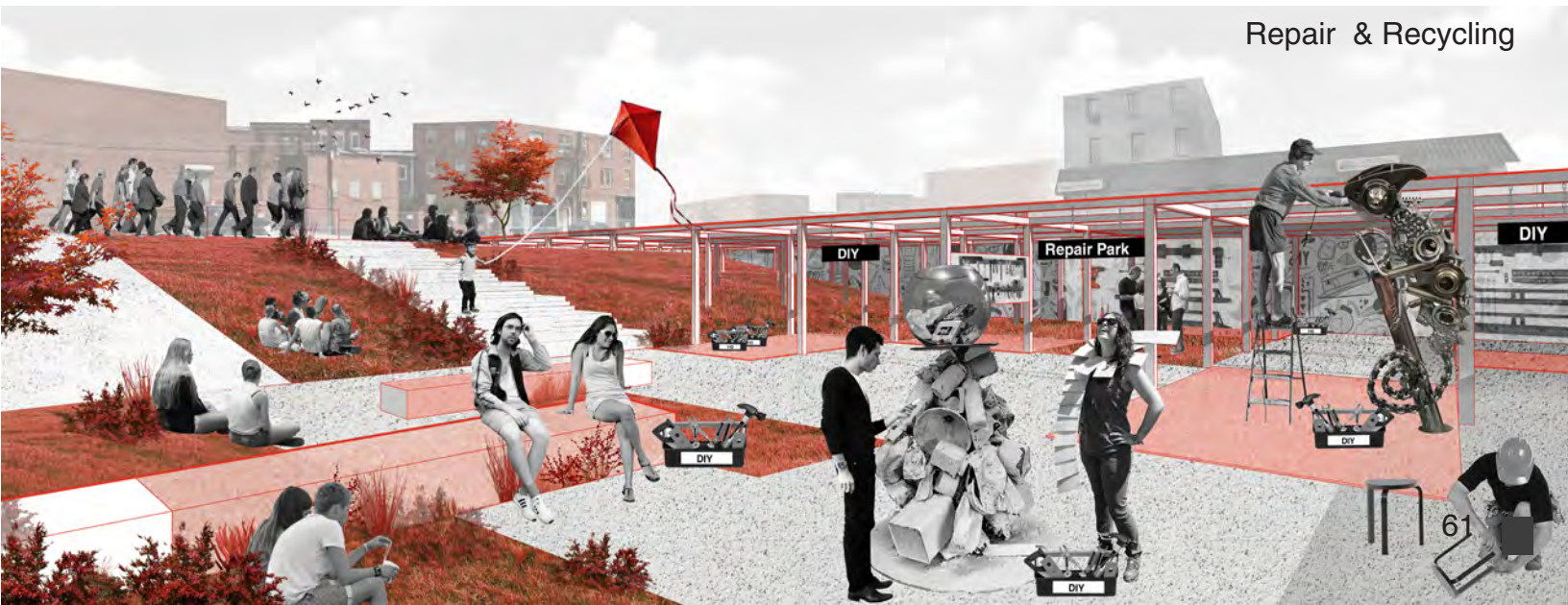
▸ **Street Extension** | Collaborative Consumption



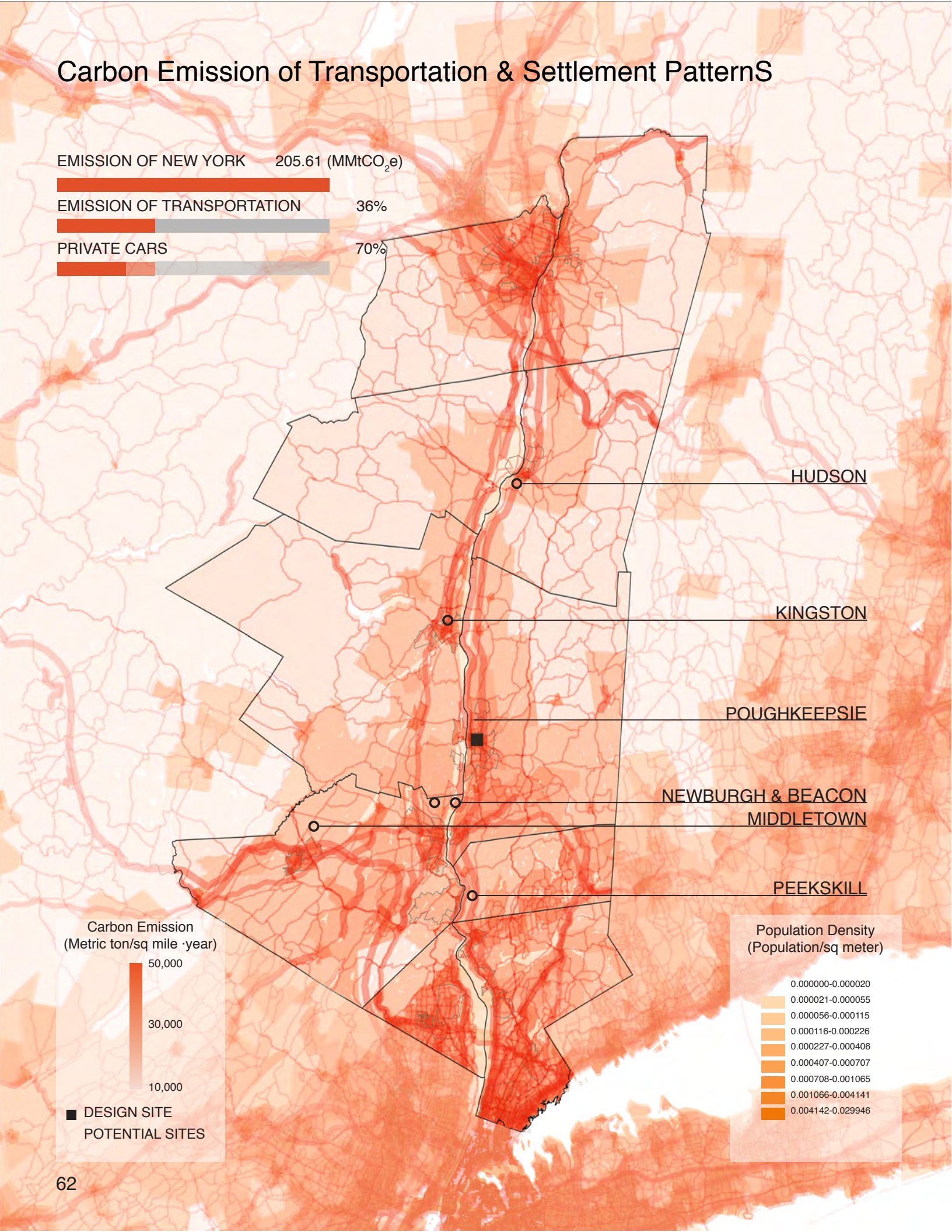
Street View

Street View

Repair & Recycling



Carbon Emission of Transportation & Settlement PatternS



Drive-Less Life

Shuo Han, Isabella Zhang, Yao Yao

Transportation contributes to 36% of greenhouse gas emissions in New York State, of which approximately 70% comes from private vehicles. In the Hudson Valley, like much of the State (except New York City), most residents own a car. This culture of car dependency is integral to extensive highway networks, poor mass transit infrastructures and the land use patterns of the suburbs – all of which contribute to high carbon emissions. DRIVE-LESS LIFE proposes a hybrid system that reduces the emissions, in a pilot study in Poughkeepsie. There are three key methods:

1. A shared shuttle system with flexible stops and schedules replaces existing buses and enables better service. This is supplemented with an experimental system of shared autonomous electric vehicles.
2. New and expanded bus stops integrate social programming to bolster transit use.
3. The elevated section of Route 9 near the Train station is removed and the area redesigned as a new street with a mix-use development that better fits the city.

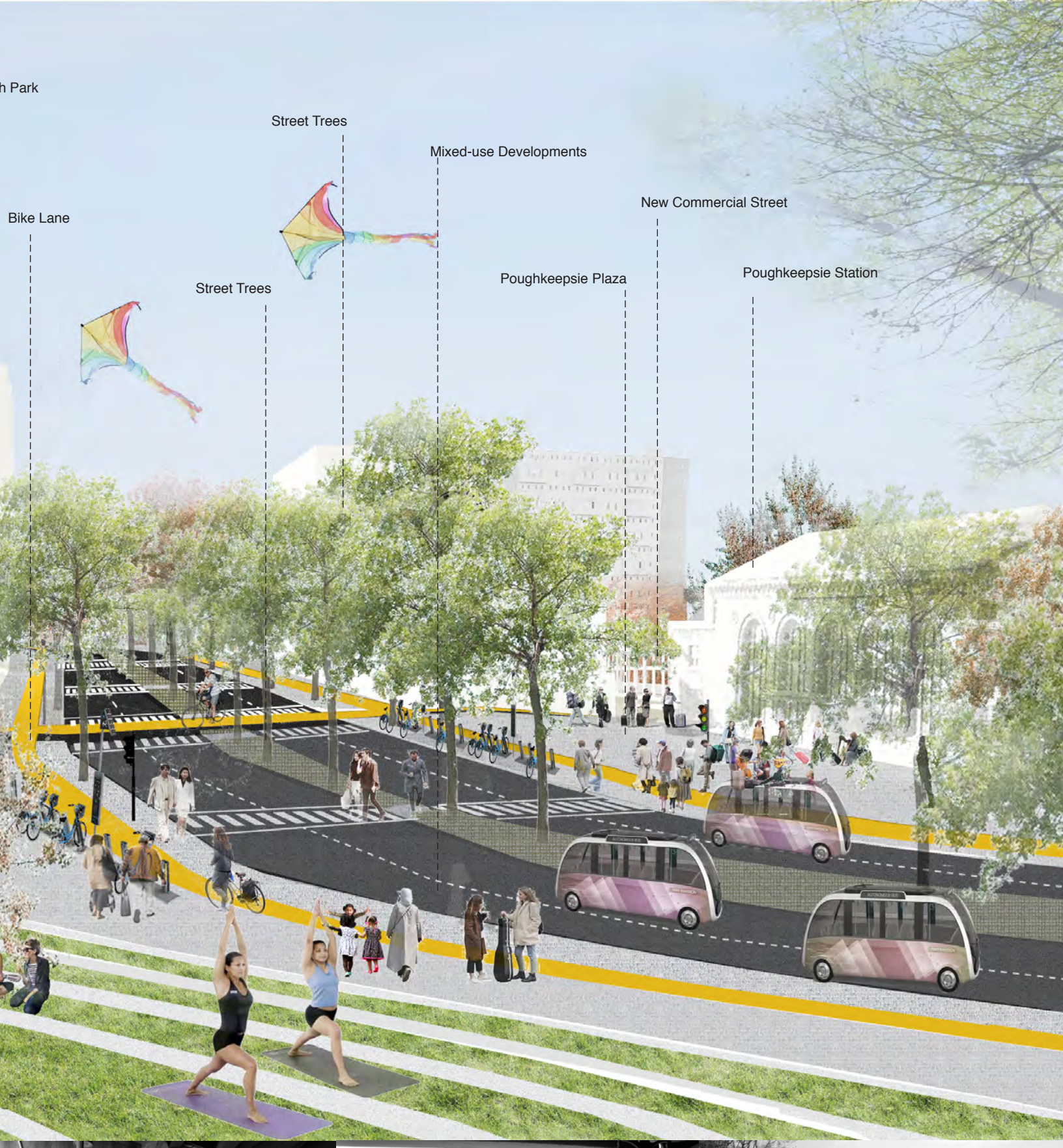
See the project's video here:
https://vimeo.com/380166505

Master plan

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

1 1.2 miles

N


h Park
Street Trees
Mixed-use Developments
Bike Lane
New Commercial Street
Street Trees
Poughkeepsie Plaza
Poughkeepsie Station


NEW YORK CENTRAL RAILROAD

Better Bus Stops

Pilot Site 1

There is only a sign next to the road in the existing stop, even no pedestrian ways. We proposed new walkway and zebra crossings, and combined cafe, waiting room and green space to the stop.

Pilot Site 2

This bus stop is in the Poughkeepsie transit hub, where the traffic is relatively busy, making it unsafe for pedestrians to walk. We reorganized the site, enabling people to walk through the whole site. A fast food restaurant is also planted in the waiting hall.

Pilot Site 3

For this site, the existing bus stop is next to the maplewood apartments, which is a low-income community. A large portion of the residents could not afford to have a private car, thus the mass transportation is rather important to their daily lives. However, the existing stop is an old small glass pavailion, both the condition and the accessbility is poor. A giant parking lot is right next to the stop, making it more friendly to drivers rather than pedestrians.

We improved the walkablity as well as the accessbility of the site, integrated a deli and a waiting room to the bus stop, and repurposed part of the existing parking lot to grocery store, community library and community garden.

a. Improved Bus Stop(With Deli)
b. Grocery
c. Community Library
d. Community Garden
e. Dining Hall
f. Playground
g. Walkway Connecting the Neighborhood
h. Bicycle Parking Area
i. Front Square
j. New Pedestrian Way
k. New Bicycle Lane
l. New Zebra Crossing

PUBLIC BUILDINGS AND INSTITUTIO

NAL SYSTEMS


GREENE COUNTY
COXSACKIE 1755/1648/633/365
GREENE 962/782/572/173
78%
SHRINKAGE
GREENE COUNTY
COLUMBIA COUNTY
ULSTER COUNTY
DUTCHESS COUNTY
DUTCHESS COUNTY
FISHKILL 1871/1616
DOWNSTATE 1122/1144/750/989
GREENHAVEN 2068/1904/877/1142
45%
SHRINKAGE
PUTNAM COUNTY
ORANGE COUNTY
WESTCHESTER COUNTY
TACONIC 502/482/350/410
BEDFORD
SING SING
24%
SHRINKAGE
WESTCHESTER COUNTY
MANHATTAN
Closed Prison
Existing Prison
Closing Prison
Mental Health
Parole Office
Job Training
Site
Train Station
Capacity
Inmates
Shrinkage
Staff

A SENTENCE REWRITTEN

Aasiya, Zhen Hua, Yuan Qin, Alvi Khan

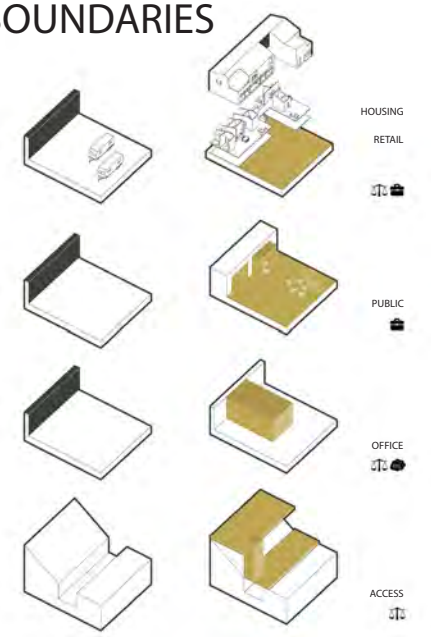
The Green New Deal focuses on three primary goals: the eradication of carbon emissions, the expansion of justice, and the provision of jobs. In the Hudson Valley, the criminal justice system ranks poorly in all three measures. Prisons in the Valley, like many across the country, have become inhumane compounds that affect prisoners and their families, and are the second most carbon-intensive public buildings after hospitals. Sing Sing Correctional facility in Ossining is a maximum-security prison just outside New York City. The facility has transitioned from coal to oil to supply its energy needs still emitting over 30,000 metric tons of carbon dioxide per year. Sited on the banks of the Hudson River, Sing Sing is vulnerable to flooding as sea levels rise. And Sing Sing remains a walled fortress, cutting off the community from the River.

A SENTENCE REWRITTEN addresses the goals of carbon, justice, and jobs, and demonstrates that Sing Sing can become a community asset, an educational facility, and a low-carbon facility.

See the project's video here:
https://vimeo.com/380152586

SITE PLAN

BOUNDARIES

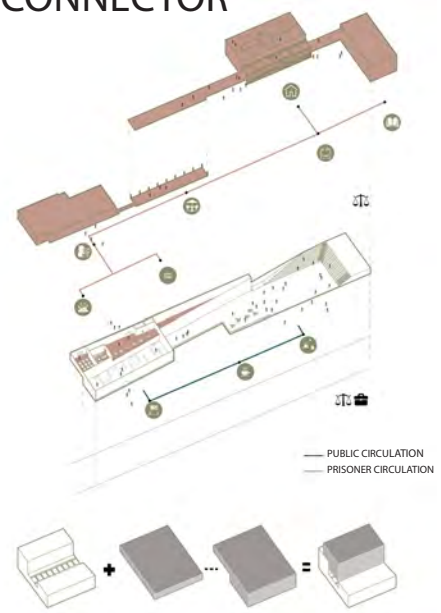

HOUSING
RETAIL
PUBLIC
OFFICE
ACCESS


EMPLOYEE HOUSING
RETAIL
PUBLIC SPACE
PUBLIC SPACE
ELEVATOR
ACCESS POINT


PRISON
MIXED USED BUILDINGS
PARK
WALKWAY

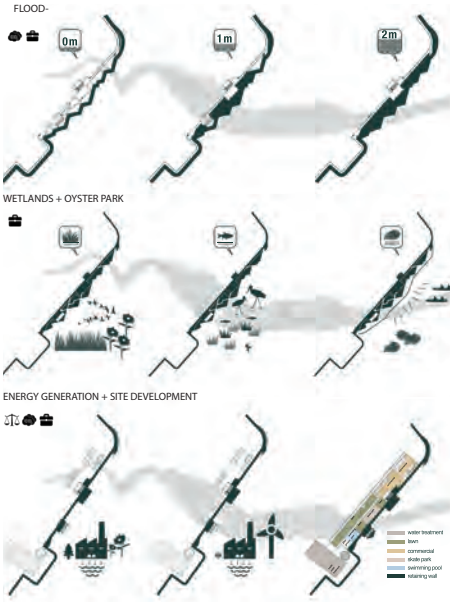

MORNING
AFTERNOON

CONNECTOR


PUBLIC CIRCULATION
PRISONER CIRCULATION


TRAINING CENTER AND LODGING
EXHIBITION AREA
ART REHABILITATION
FAMILY REHABILITATION
PRISON

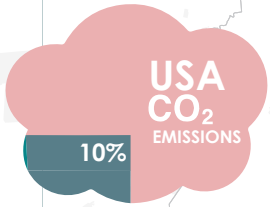
WATERFRONT


FLOOD-
0m
1m
2m
WETLANDS + OYSTER PARK
ENERGY GENERATION + SITE DEVELOPMENT

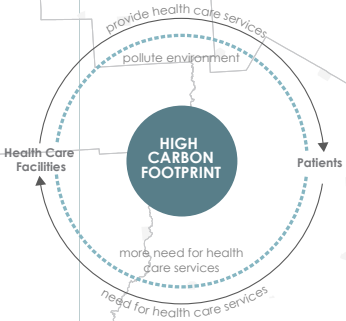

RETAIL
OBSERVATION
CAFES
WETLANDS
PARK
MEMORIAL
BERM
OYSTER

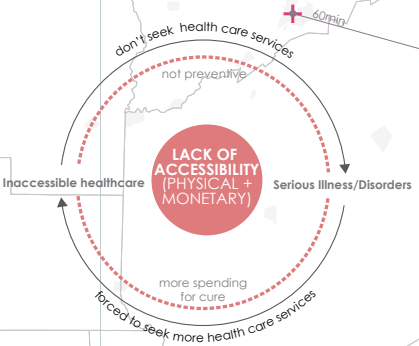

TRAINING CENTER AND LODGING
EXHIBITION AREA
MEMORIAL PARK
PROTECTIVE PARK
SEASONAL EVENT
MARSHLANDS
AQUATIC ACTIVITIES
OYSTER FARMING

HEALTH CARE IN THE HUDSON VALLEY

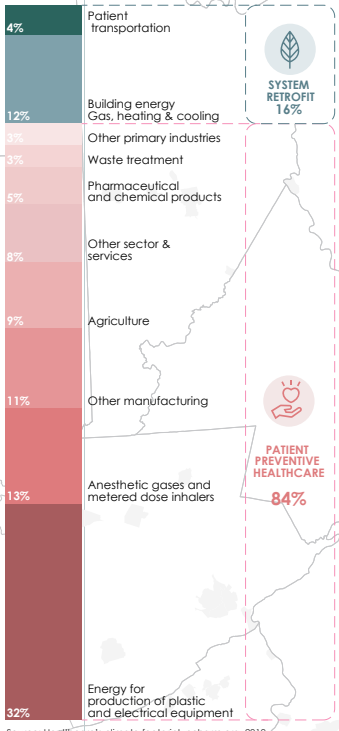


U.S.A. HEALTH SECTOR



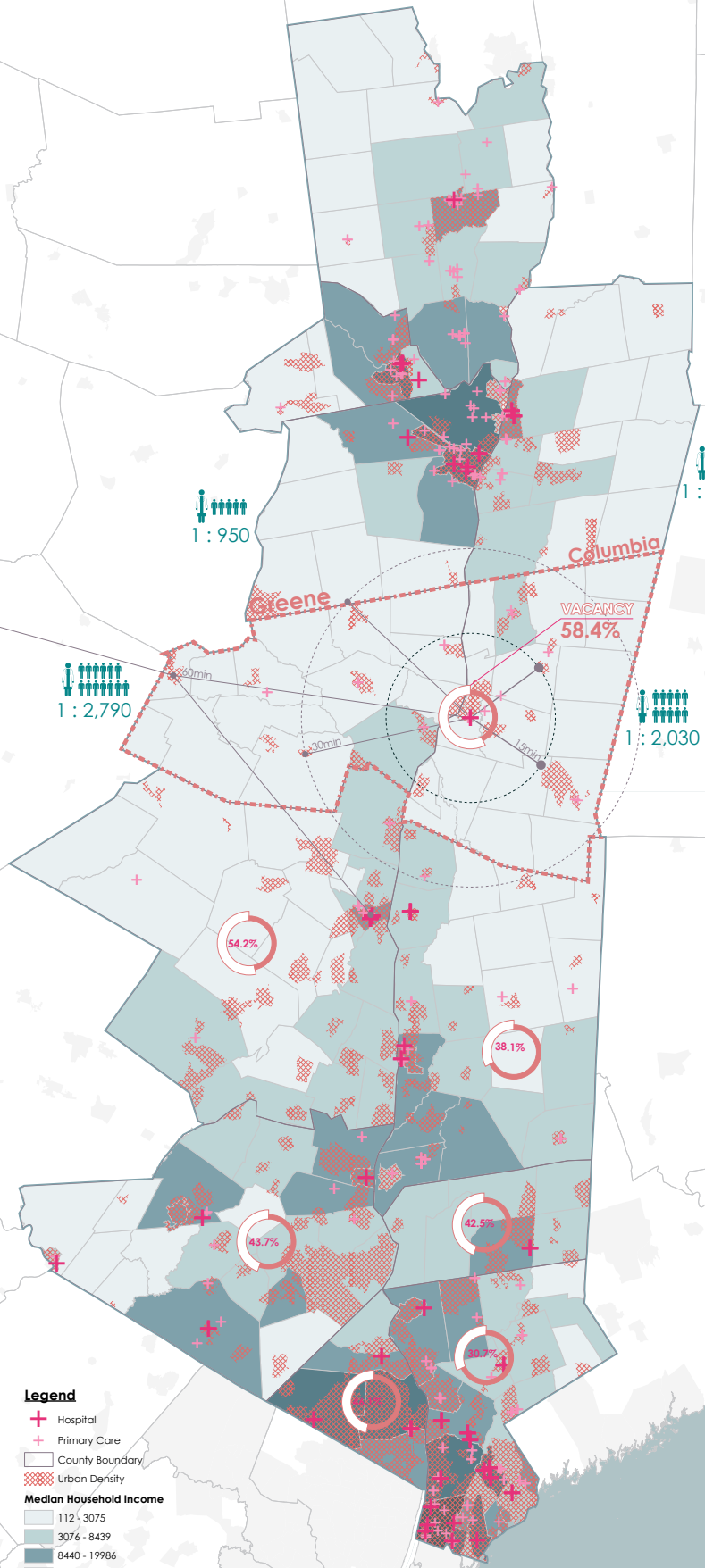


HEALTHCARE SYSTEM CARBON EMISSIONS



Source: Healthcare's climate footprint, noharm.org, 2019

84% CO_2 comes from Health System supplies



Source for Vacancy - Hudson Valley pattern for progress
http://www.pattern-for-progress.org/
Source for Physician to Patient ratio - Healthy Capital District Initiative (HCDI)

GOALS:
LOWER THE ENVIRONMENTAL IMPACTS
ELIMINATE THE HEALTH DISPARITIES

DISPERSING WELLNESS

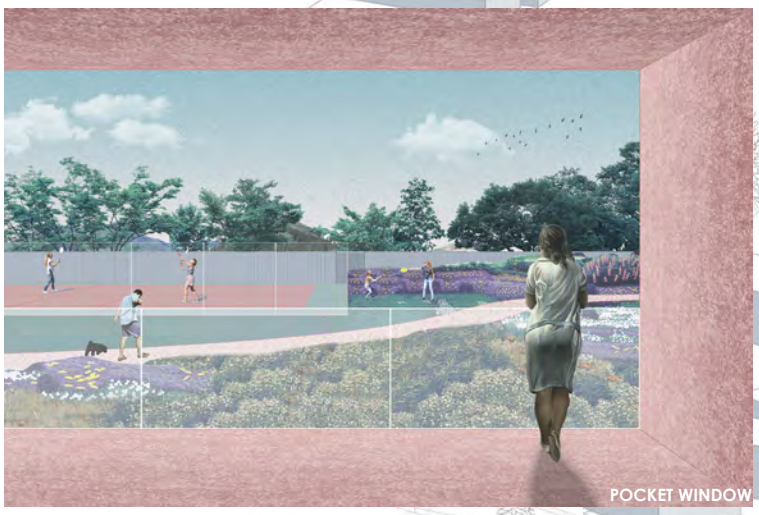
Mansoo Han, Niharika Shekhawat, Shailee Shah, Ting Zhang

The healthcare industry accounts for 10% of the greenhouse gas emissions in the United States and 9% of non-GHG pollutants. Globally, Pollution is associated with 9million premature deaths. The very same system to ensure our health and well-being is contributing significantly to the growing public health challenge presented by global warming. In the Hudson Valley, dispersed settlement patterns shape the health-seeking behavior of most people, and residents travel as much as 1.5 hours one way for basic health services. At the same time, many hospitals in the Hudson Valley have a high vacancy rate for bed space. Side by side, the healthcare landscape in the Valley is inefficient, unhealthy and carbon costly.

DISPERSING WELLNESS reorganizes healthcare service delivery focusing on Greene and Columbia Counties. Small, healthcare modules in small towns and villages throughout the region – with regular schedules by medical professionals – provide wellness care for the needs of the rural populations as well new community spaces. In parallel Kingston's HealthAlliance Hospital is reprogrammed as a hub of this system of modules and providing for more community-based health and social needs.

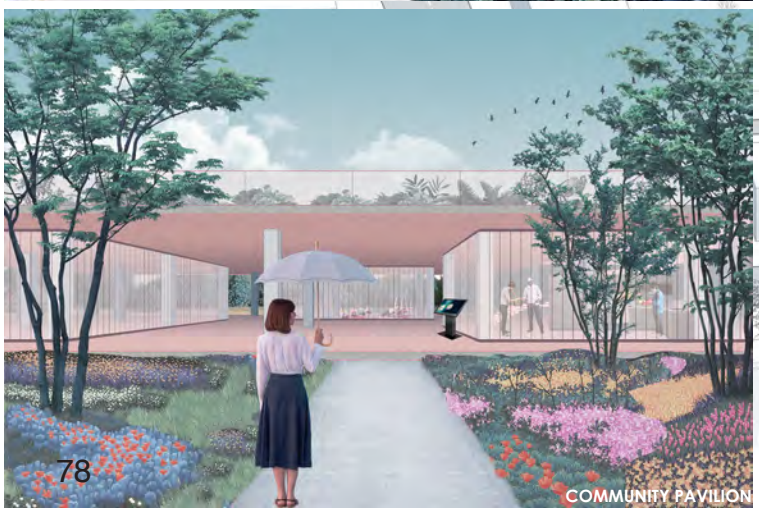
See the project's video here:
https://vimeo.com/380161906

STEPPED GREEN ROOF



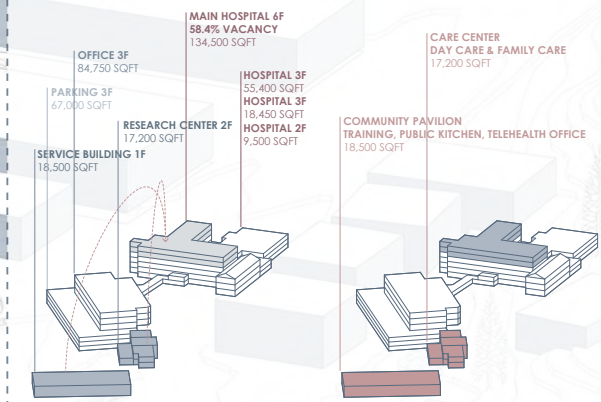
POCKET WINDOW

CHILDREN'S PLAYGROUND



COMMUNITY PAVILION

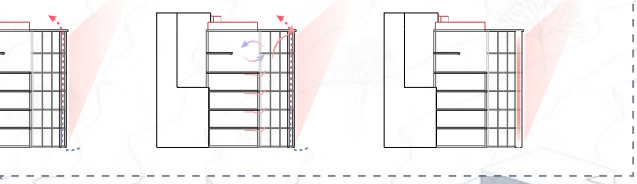
PROGRAM TRANSITION



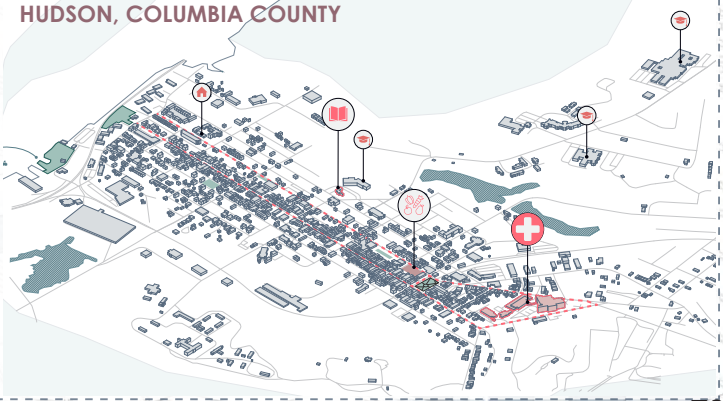
DOUBL

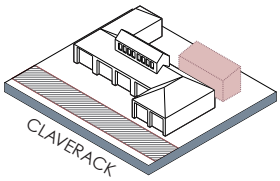
COMMUNITY PAVILION

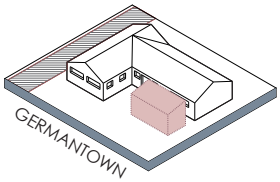
E SKIN FACADE

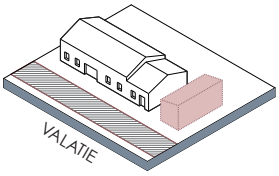


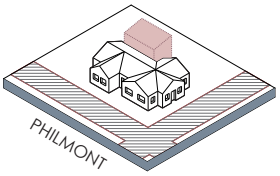
COLUMBIA MEMORIAL HOSPITAL
HUDSON, COLUMBIA COUNTY

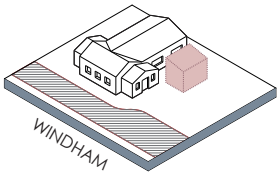




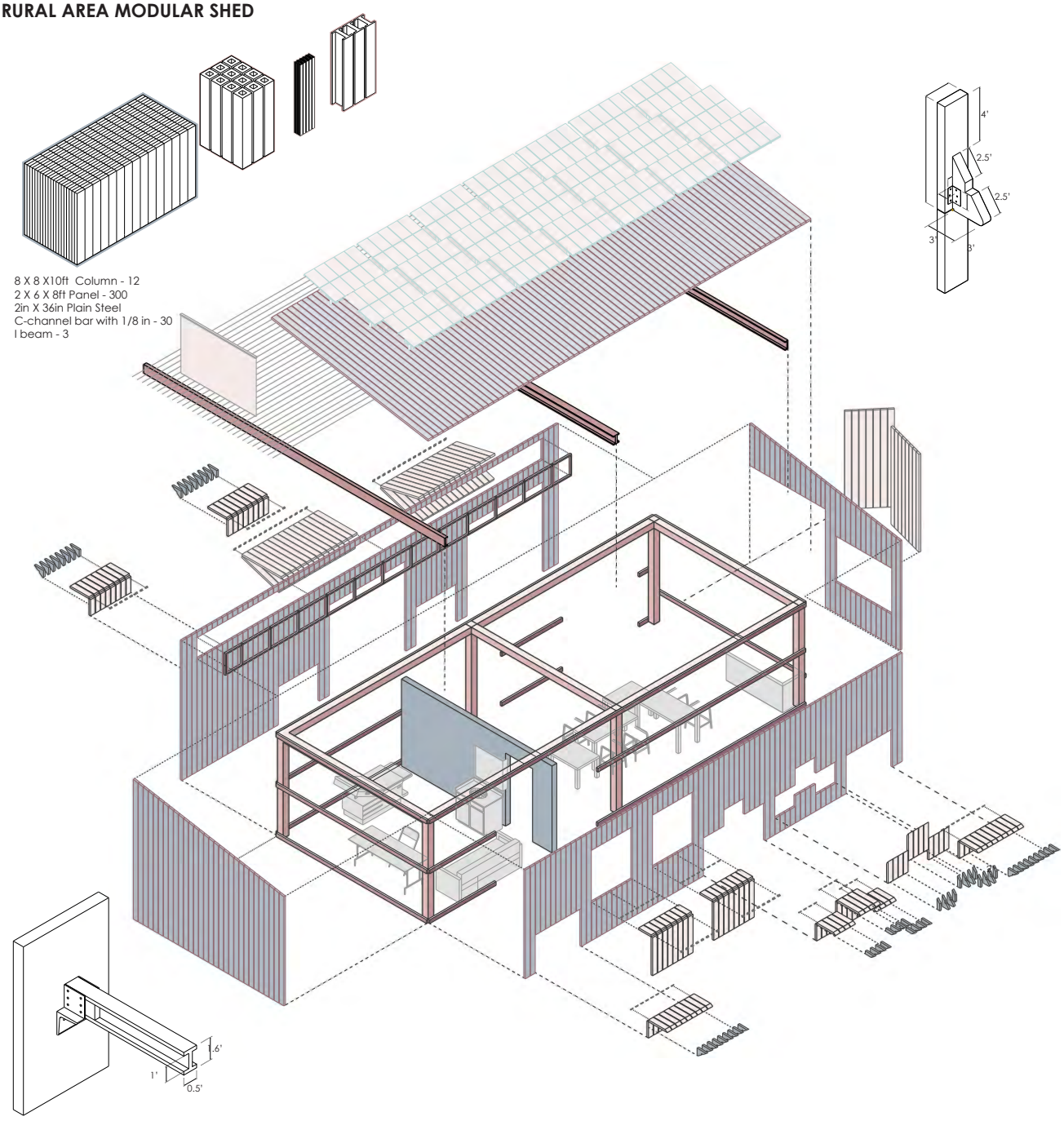






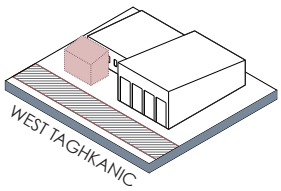


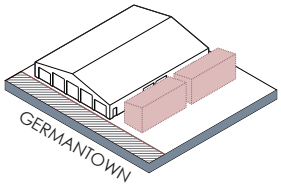
RURAL AREA MODULAR SHED

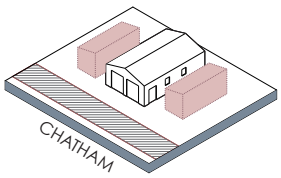


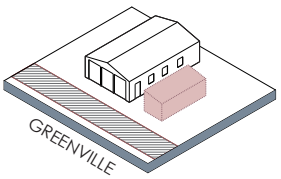
PUBLIC PROMENADE

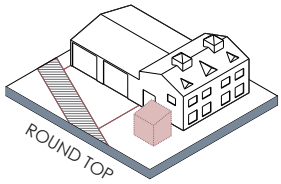
STOREFRONT HEALTHCARE



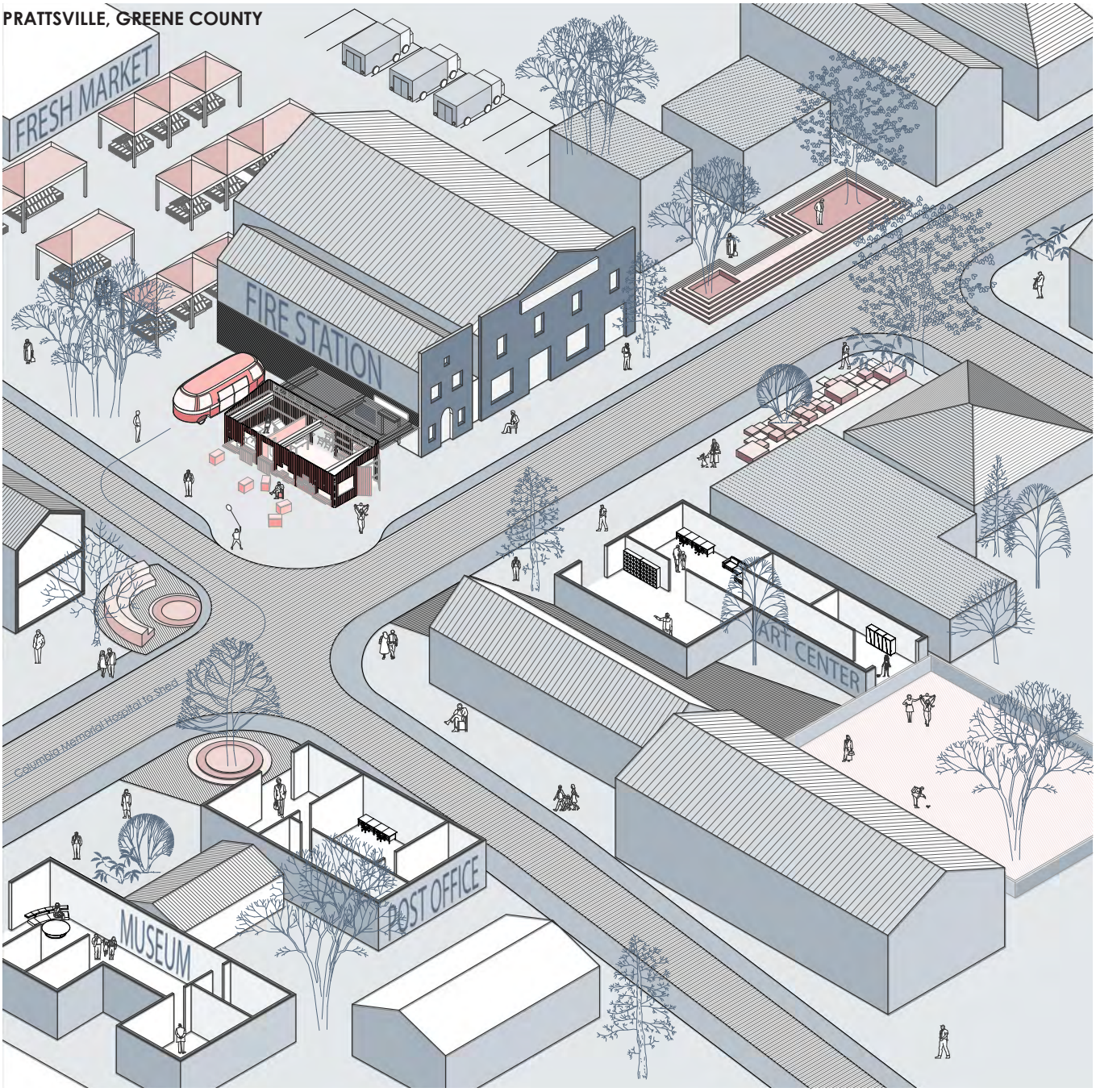






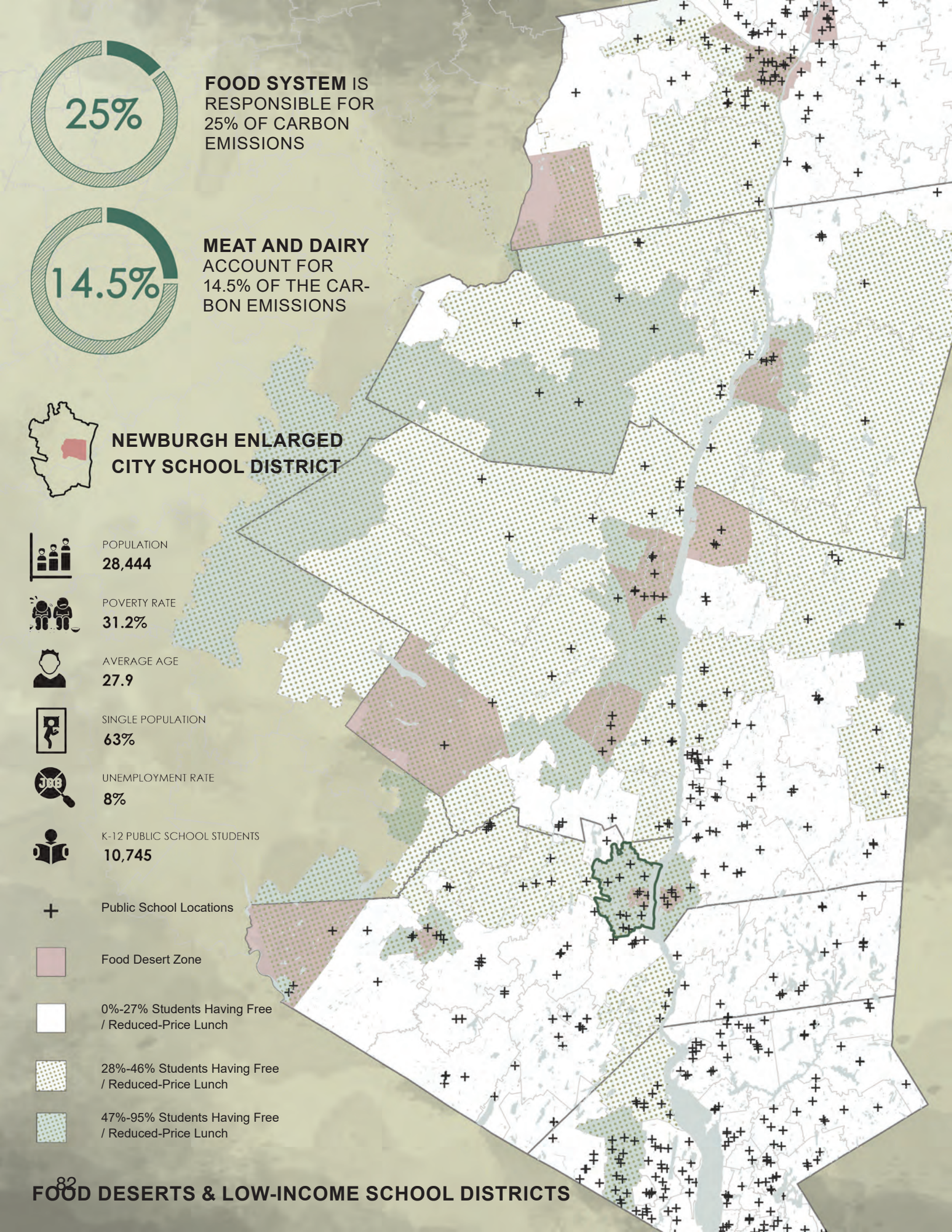


PRATTSVILLE, GREENE COUNTY



SHED AS A LIVING ROOM

HEALTHCARE CENTER



FOOD DESERTS & LOW-INCOME SCHOOL DISTRICTS

What's on your plate? Food as Knowledge

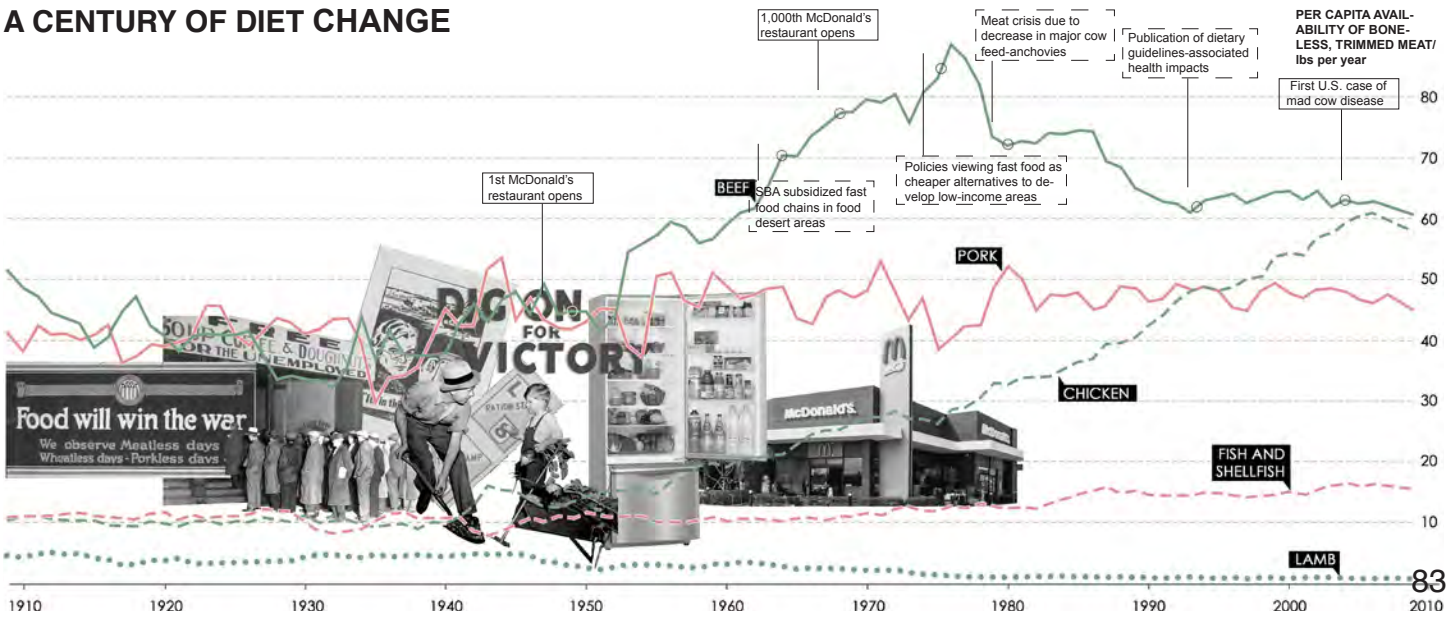
Annie Wu, Moneerah Alajaji, Vasanth Mayilvahanan, Wei Zhang

Access to fresh produce is clear goal for communities seeking improved public health, and a lower carbon footprints. Yet these same communities face food insecurity, that is, a diet of processed fatty foods and high-fat meat products that are lower in cost, travel a great distance and are available in stores and fast food outlets. The Hudson Valley's Orange County is among the highest consumers of meat despite its being home to many produce farms. In Newburgh, one-third of the population consists of diverse and largely poor school-age children, most of whom are food insecure.

WHAT'S ON YOUR PLATE aims to change diets of the next generation as a way of influencing a larger shift to low-emission diets. It redesigns the food system to provide fresh produce and higher quality food, produced locally, in schools as the basis of health and food pedagogy. Many schools in the United States lack adequate cooking and food prep capacities to provide such meals. Using two schools in Newburgh as a test site, the project creates space for local food producers, school food authorities, students and local residents encouraging a new understanding of food, health and carbon footprints.

See the project's video here:
https://vimeo.com/380164272

A CENTURY OF DIET CHANGE



HIGH SCHOOL
3217 (TWO SCHOOLS COMBINED)
NEWBURGH FREE ACADEMY

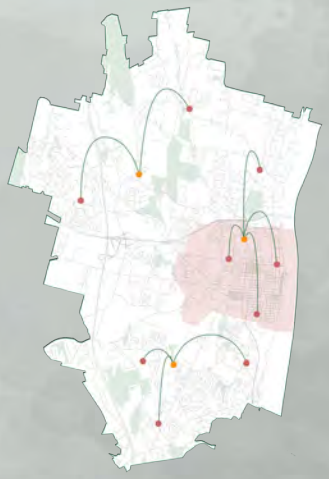
K-5
791
GAMS TECH MAGNET SCHOOL

HIGH SCHOOL
3217 (TWO SCHOOLS COMBINED)
NEWBURGH FREE ACADEMY NORTH

K-5
512
HORIZON ON THE HUDSON

SOUTH MIDDLE SCHOOL
MIDDLE SCHOOL
729

CENTRAL KITCHEN
SATELLITE SCHOOL
HIGH POPULATION DENSITY
INTERVENTION AREA
TRUCK ROUTE



ONLY 1 IN 10 CHILDREN IN THE US
consumes 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

1 IN 10 ELEMENTARY SCHOOLS
also does the same

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

SYSTEM RECONSTRUCTION

SATELLITE SCHOOLS

STAKEHOLDERS:

NATIONAL FUNDING
USDA NATIONAL SCHOOL LUNCH PROGRAM

STATE FUNDING
USDA FARM TO SCHOOL GRANT PROGRAM
((AT LEAST 51% PRODUCE WITHIN STATE)

CENTRAL SCHOOL KITCHEN

STAKEHOLDERS:

NATIONAL FUNDING
USDA NATIONAL SCHOOL LUNCH PROGRAM

STATE FUNDING
USDA FARM TO SCHOOL GRANT PROGRAM
((AT LEAST 51% PRODUCE WITHIN STATE)

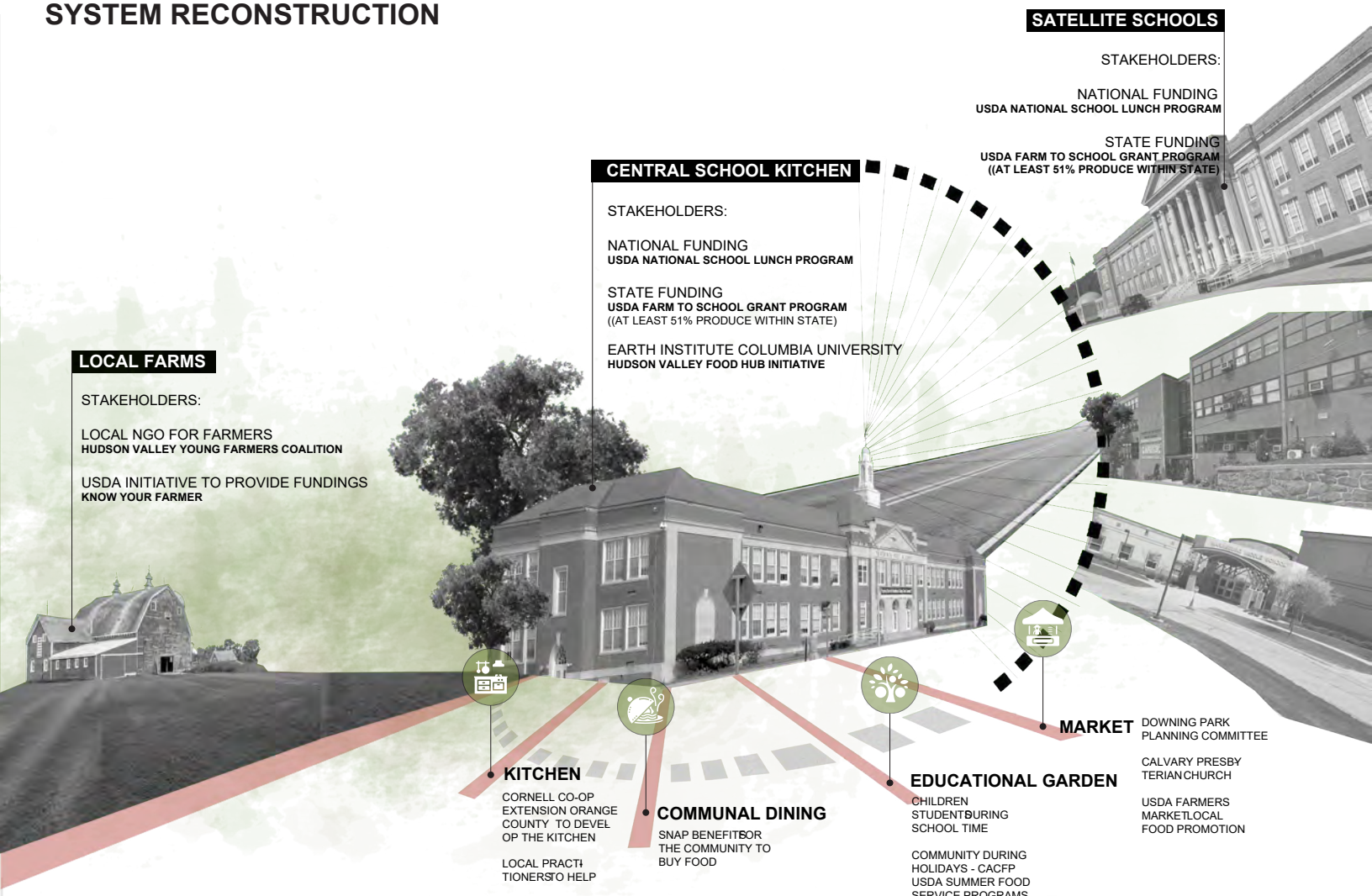
EARTH INSTITUTE COLUMBIA UNIVERSITY
HUDSON VALLEY FOOD HUB INITIATIVE

LOCAL FARMS

STAKEHOLDERS:

LOCAL NGO FOR FARMERS
HUDSON VALLEY YOUNG FARMERS COALITION

USDA INITIATIVE TO PROVIDE FUNDINGS
KNOW YOUR FARMER



KITCHEN

CORNELL CO-OP EXTENSION ORANGE COUNTY TO DEVELOP THE KITCHEN

LOCAL PRACTITIONERS TO HELP

EMPLOYMENT FOR THE COMMUNITY - ORANGE COUNTY ECONOMIC DEVELOPMENT

COMMUNAL DINING

SNAP BENEFITS FOR THE COMMUNITY TO BUY FOOD

EDUCATIONAL GARDEN

CHILDREN STUDENT DURING SCHOOL TIME

COMMUNITY DURING HOLIDAYS - CACFP USDA SUMMER FOOD SERVICE PROGRAMS (STATE LEVEL)

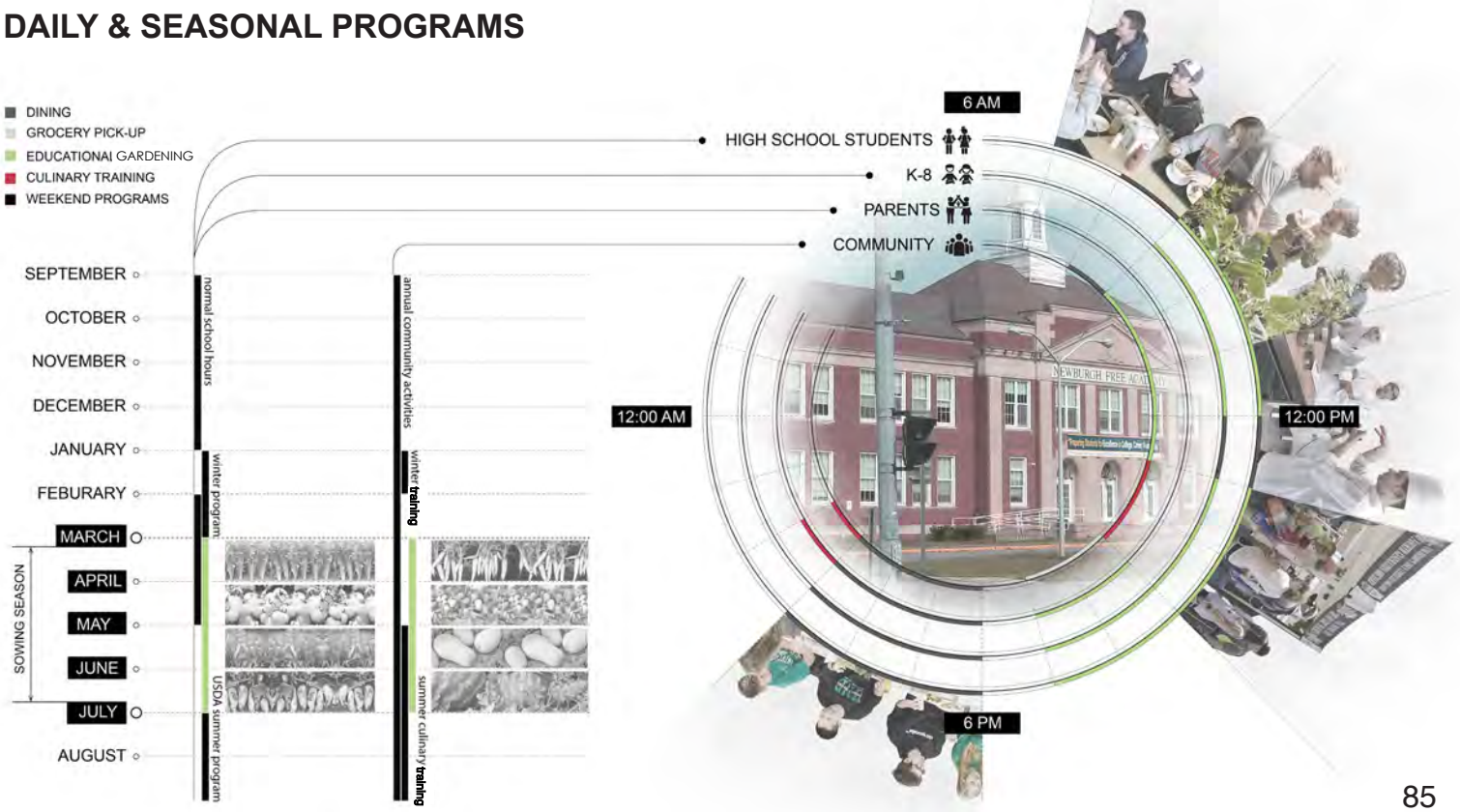
MARKET

DOWNING PARK PLANNING COMMITTEE

CALVARY PRESBYTERIAN CHURCH

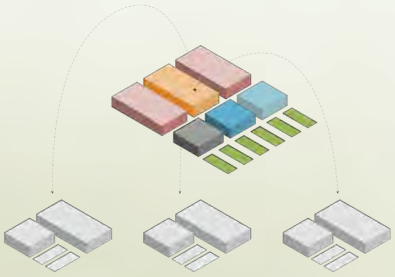
USDA FARMERS MARKET LOCAL FOOD PROMOTION

DAILY & SEASONAL PROGRAMS



CENTRAL KITCHEN:

NEWBURGH FREE ACADEMY & GAMS TECH MAGNET SCHOOL



- DINING SPACE
- CENTRAL KITCHEN
- LEARNING GARDEN
- WET STORAGE
- DRY STORAGE
- PACKAGING SPACE

HEALTH LIBRARY

MARKET/GARDEN

WELCOME CENTER

MULTI-FUNCTION DINING HALL

MULTI-FUNCTION DINING HALL

WALK-IN STORAGE

COMMUNITY DINING

K-5 DINING

CORRIDOR

LEARNING GARDEN

FOOD LAB

ENTRANCE

- COMMUNITY CIRCULATION
- STUDENT CIRCULATION
- TRUCK CIRCULATION

LEARNING GARDEN

COMMUNITY GARDEN

GROCERY MARKET

GREEN ROOF

GREEN ROOF

UNLOADING AREA

COMMUNITY ENTRANCE

COMMUNITY GARDEN

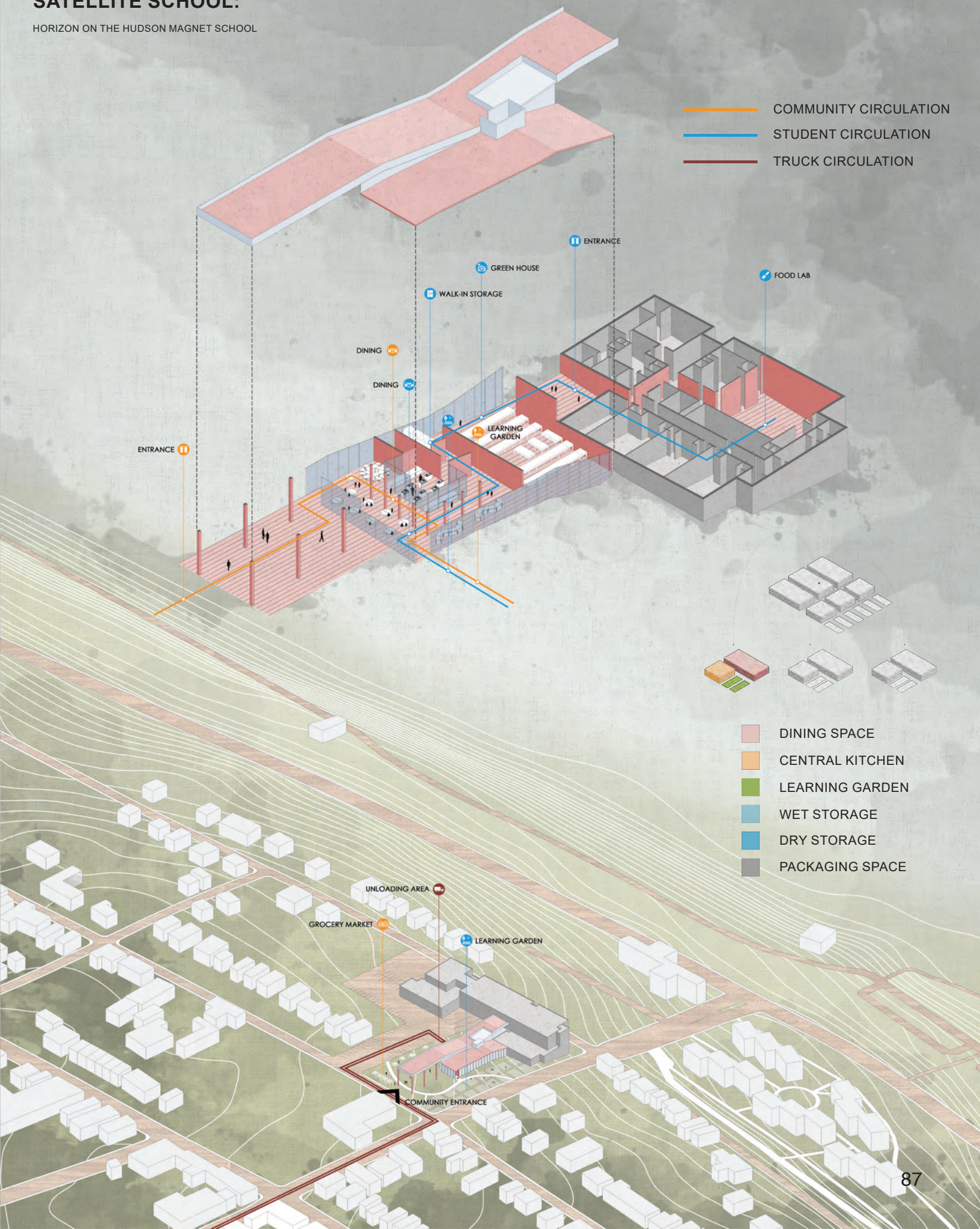
DRIVE-THROUGH GROCERY STORE

LEARNING GARDEN

COMMUNITY ENTRANCE

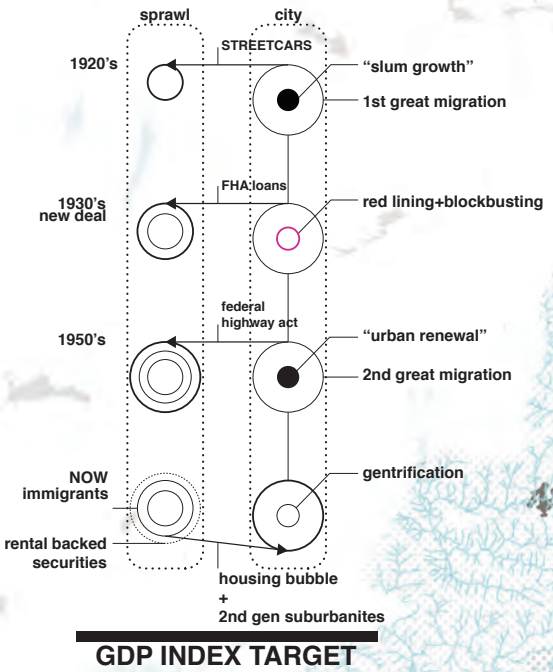
SATELLITE SCHOOL:

HORIZON ON THE HUDSON MAGNET SCHOOL



SUBURBAN LIVES

Sprawl, CO2 Emissions & Potential Natural Connections in The Hudson Valley



These Routes Are Made For Walking

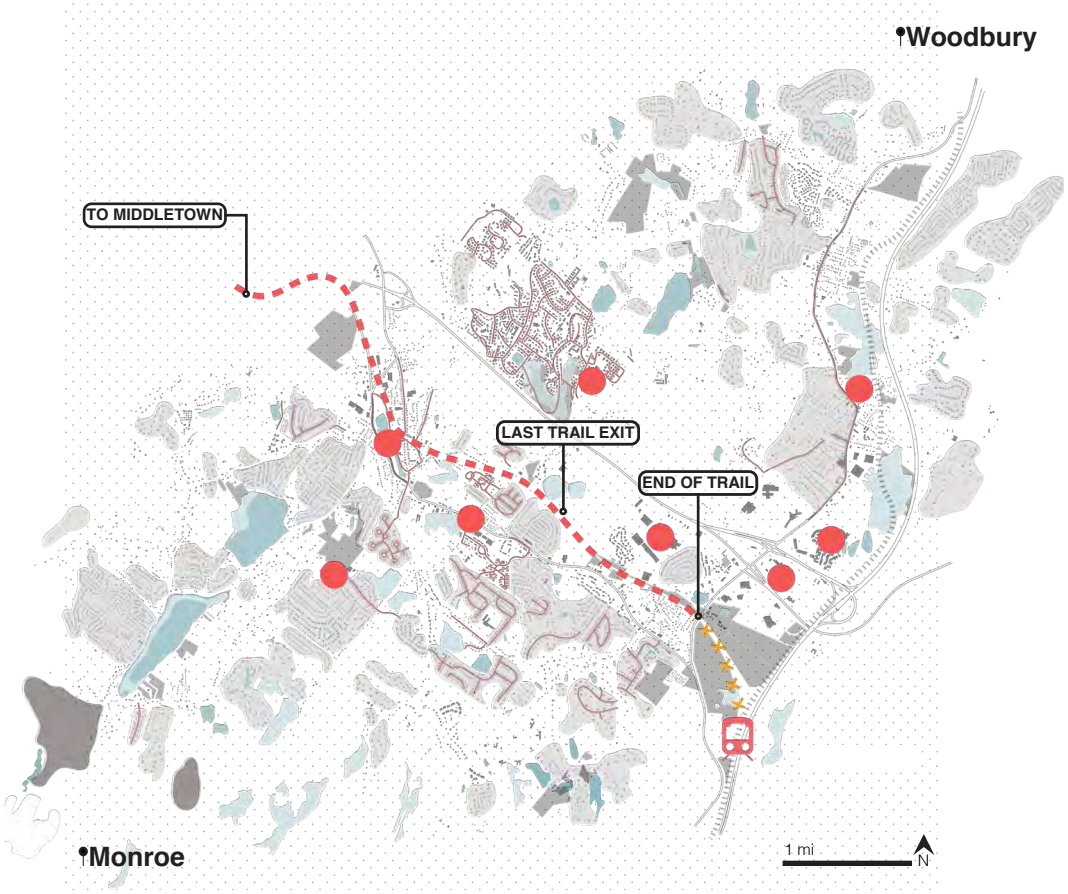
Yile Xu, Jaime Palacios, Kunal Mokasdar, Lino Caceres.

The suburbanization of the New York region has benefited many but, at the same time, has consisted of narrow policies, financial incentives, and ecosystem blindness that can no longer be ignored. Sprawl has been a major contributor to carbon emissions, enabled by automobiles (and trucks) and single family houses. Suburbs have not proved to be the haven they were supposed to be. The Green New Deal offers a framework to redirect resources and policies and create an entirely different social and physical context for daily life.

THESE ROUTES… remakes the carbon emitting landscape of sprawl near the famous Woodbury Commons in Orange County. The project updates existing infrastructures to reduce carbon emissions, connect communities and enable diverse commuting and movement patterns. New and existing land use guidelines protect land, create opportunities for green corridors joining formerly disconnected communities and enable new forested and open public spaces. The project evolves over time, as more paths are built, as people chose alternative mobilities, and as new green and open spaces become cherished community amenities.

See the project's video here:
https://vimeo.com/380163656

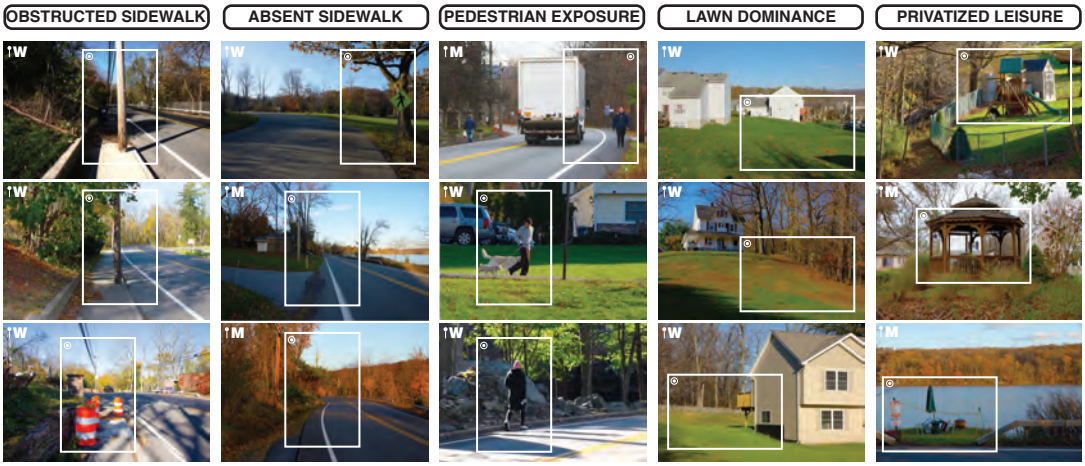
01 EXISTING DISCONNECTION



ACTIVITY NODES ARE DISCONNECTED BETWEEN THEM AND WITH MOST OF THE SITE.

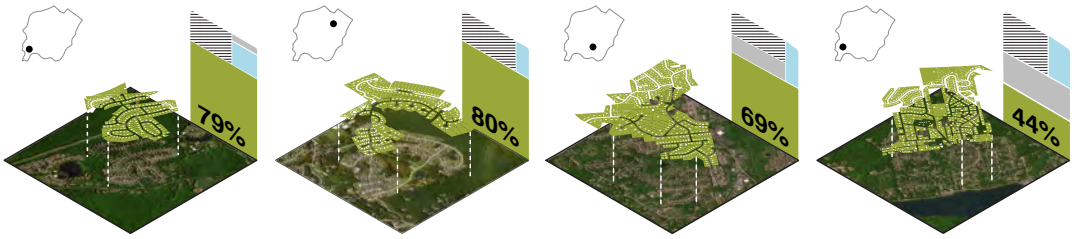
- port-jarvis rail
- existing trail
- closed trail
- existing sidewalks
- existing nodes
- sprawl
- vacant lands
- wetlands
- water bodies

02 WHY DO WE PREFER CARS?



- Ⓜ Monroe
- Ⓦ woodbury

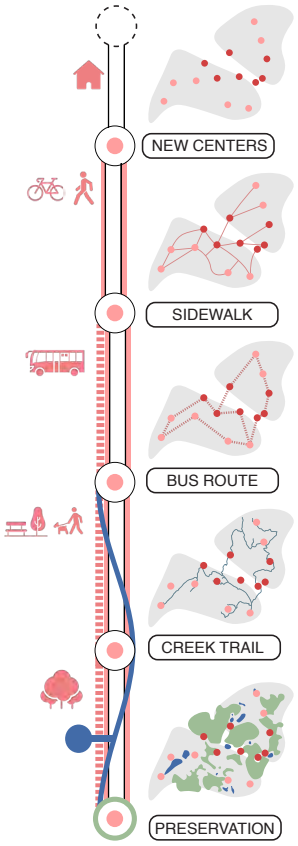
03 SPRAWL'S LAND USE

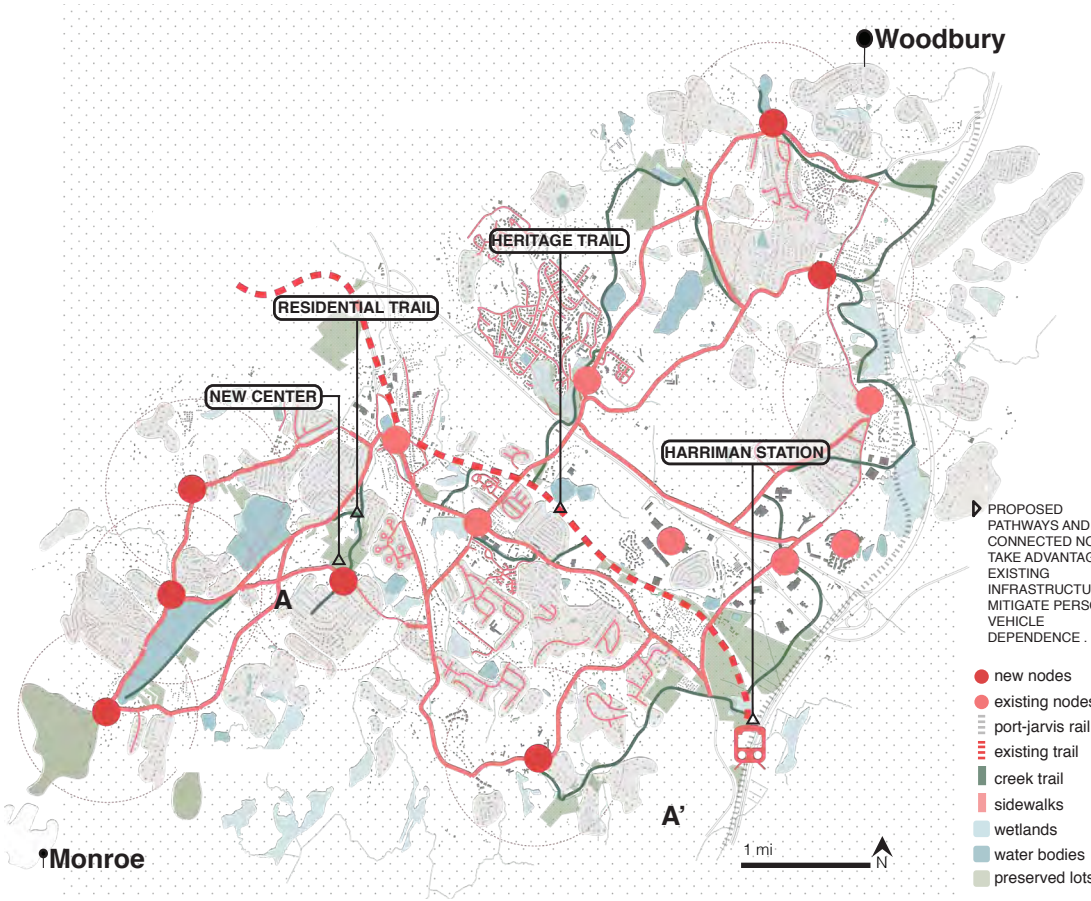


LAWN IS THE MOST POLLUTING CROP DUE TO PESTICIDES WATER USAGE AND MAINTENANCE MACHINERY.

- sprawl
- housing footprint
- water bodies
- lawns

04 PROPOSED NETWORK

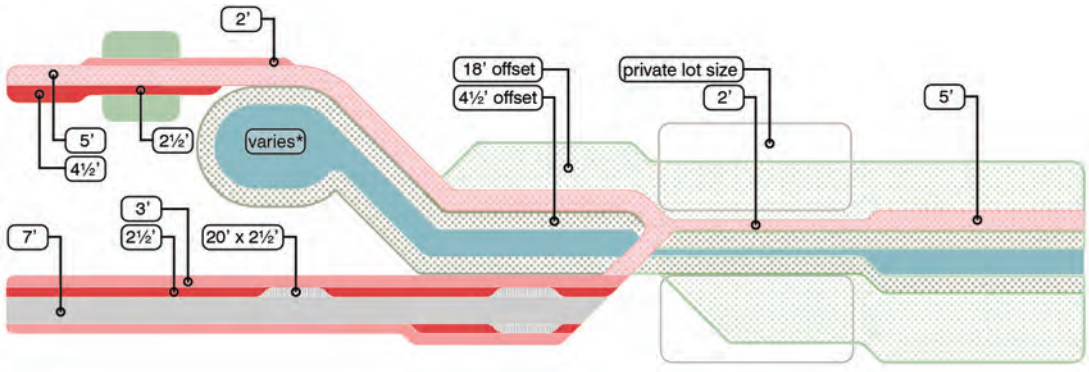




PROPOSED PATHWAYS AND NEW CONNECTED NODES, TAKE ADVANTAGE OF EXISTING INFRASTRUCTURE TO MITIGATE PERSONAL VEHICLE DEPENDENCE .

- new nodes
- existing nodes
- port-jarvis rail
- existing trail
- creek trail
- sidewalks
- wetlands
- water bodies
- preserved lots

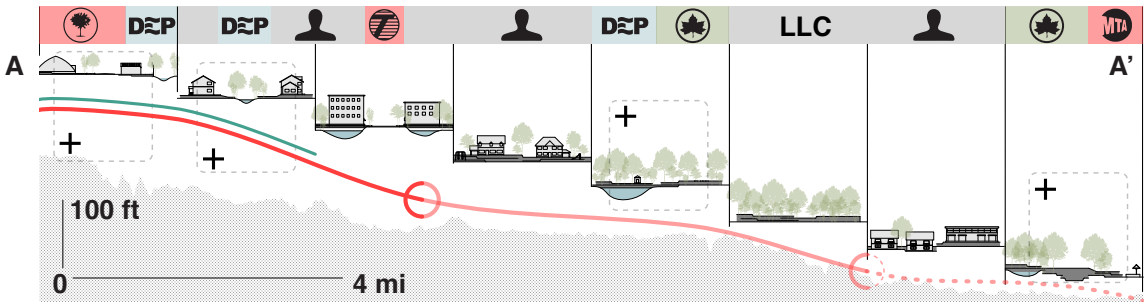
05 PATHWAY DIAGRAM



NEW PATHS HOST DIFFERENT USES TO INCREASE TRANSPORTATION OPTIONS

- roads
- water body
- creek trail
- bus route
- bike path
- new sidewalks
- 18' buffer area
- 4 1/2' buffer area
- open public space

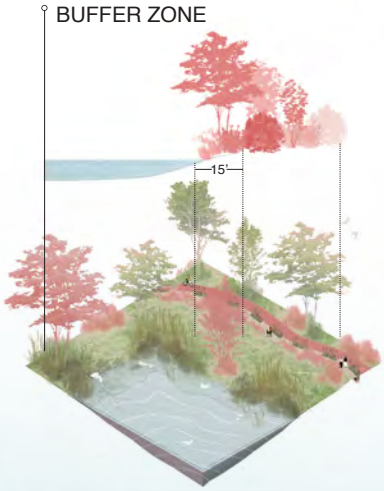
06 STAKEHOLDER SECTION



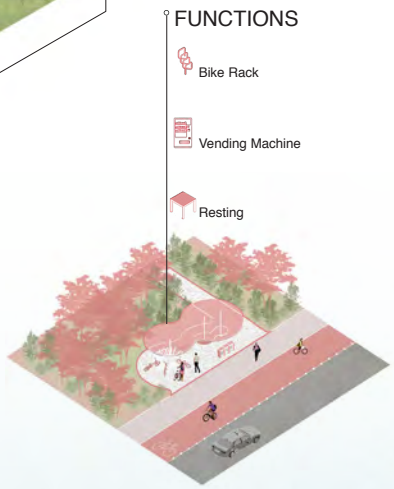
PRIVATE PUBLIC PARTNERSHIPS ARE PROMOTED TO ALLOW THE PATHS TO REACH AS MANY COMMUNITIES AS POSSIBLE.

- trail
- creek trail
- sprawl
- project site
- water bodies
- open public space

HERITAGE TRAIL

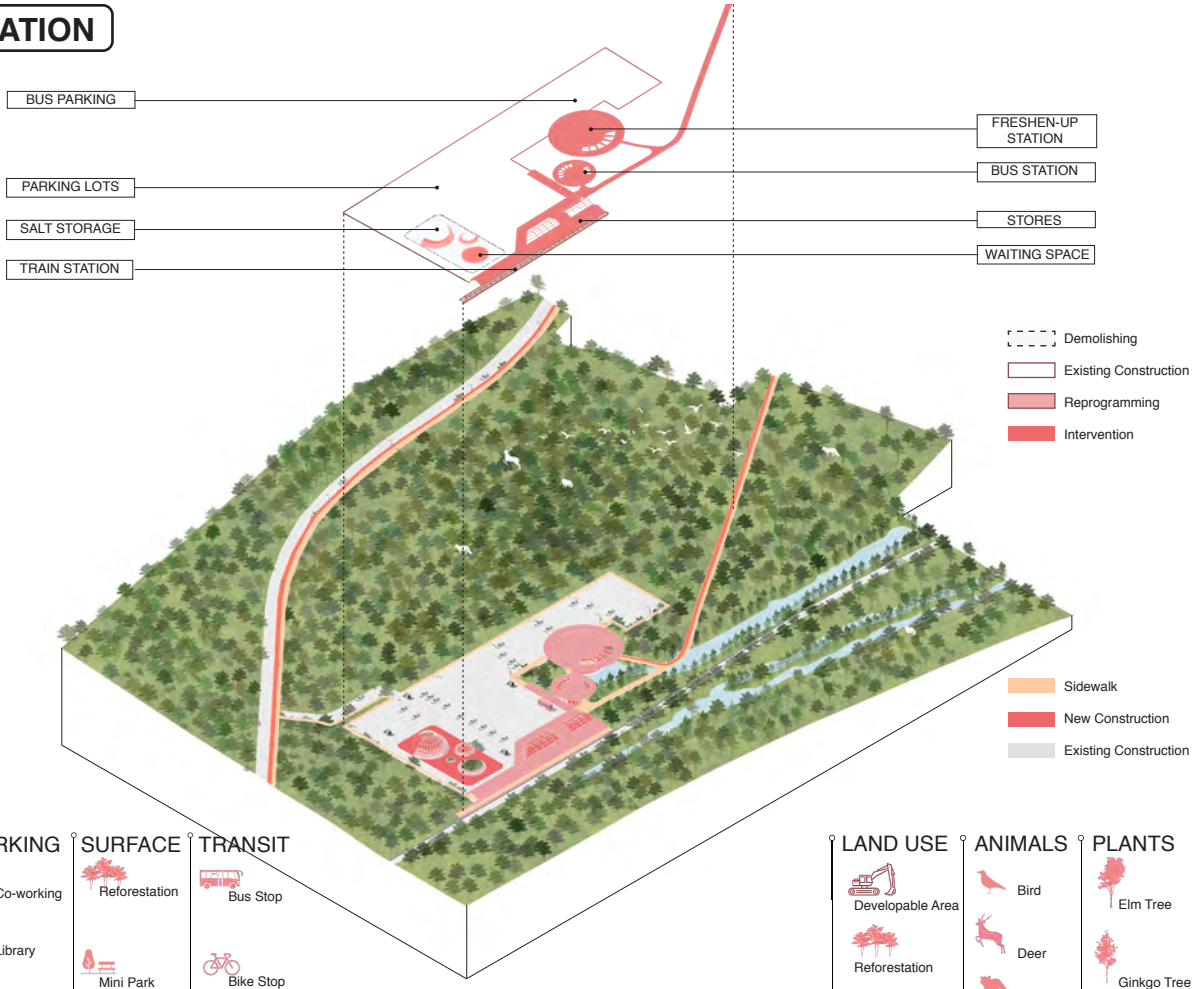


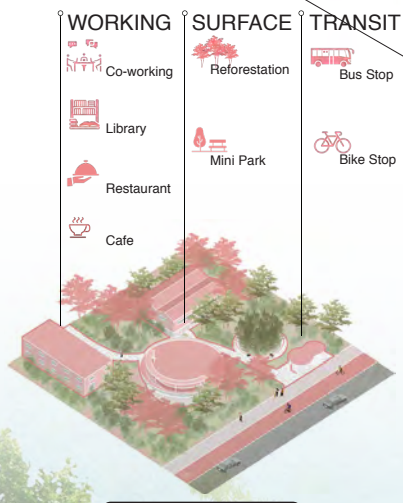
WETLAND



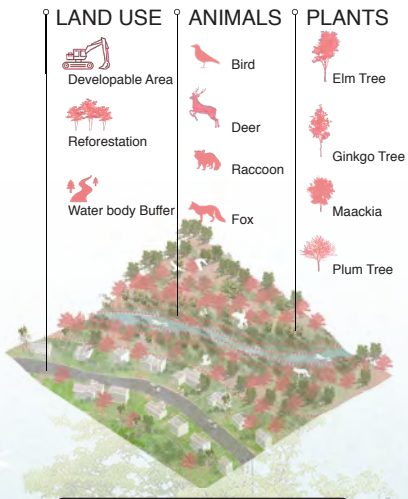
BIKE STOP

TRAIN STATION



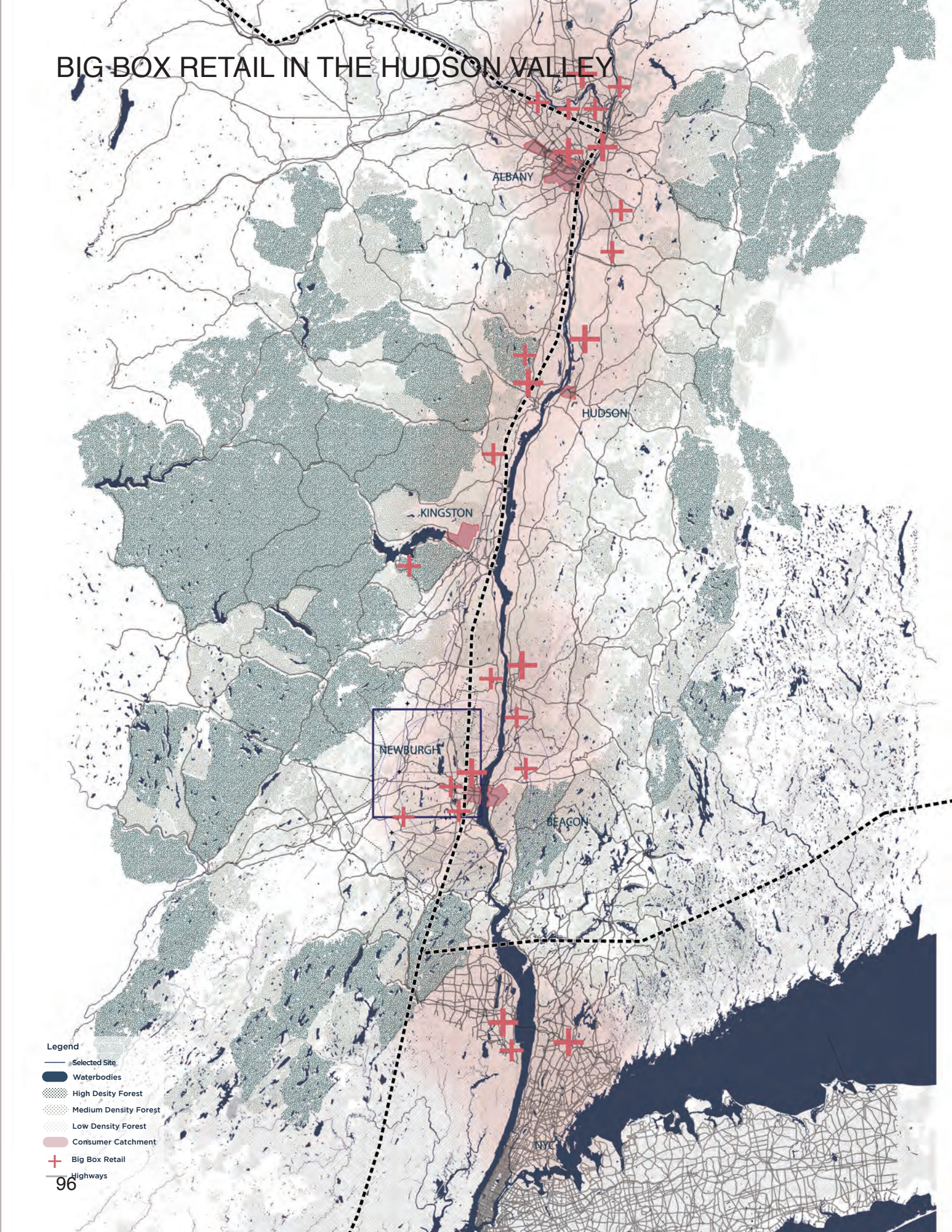


NEW CENTER



PRESERVATION AREA

BIG BOX RETAIL IN THE HUDSON VALLEY



UNBOXED

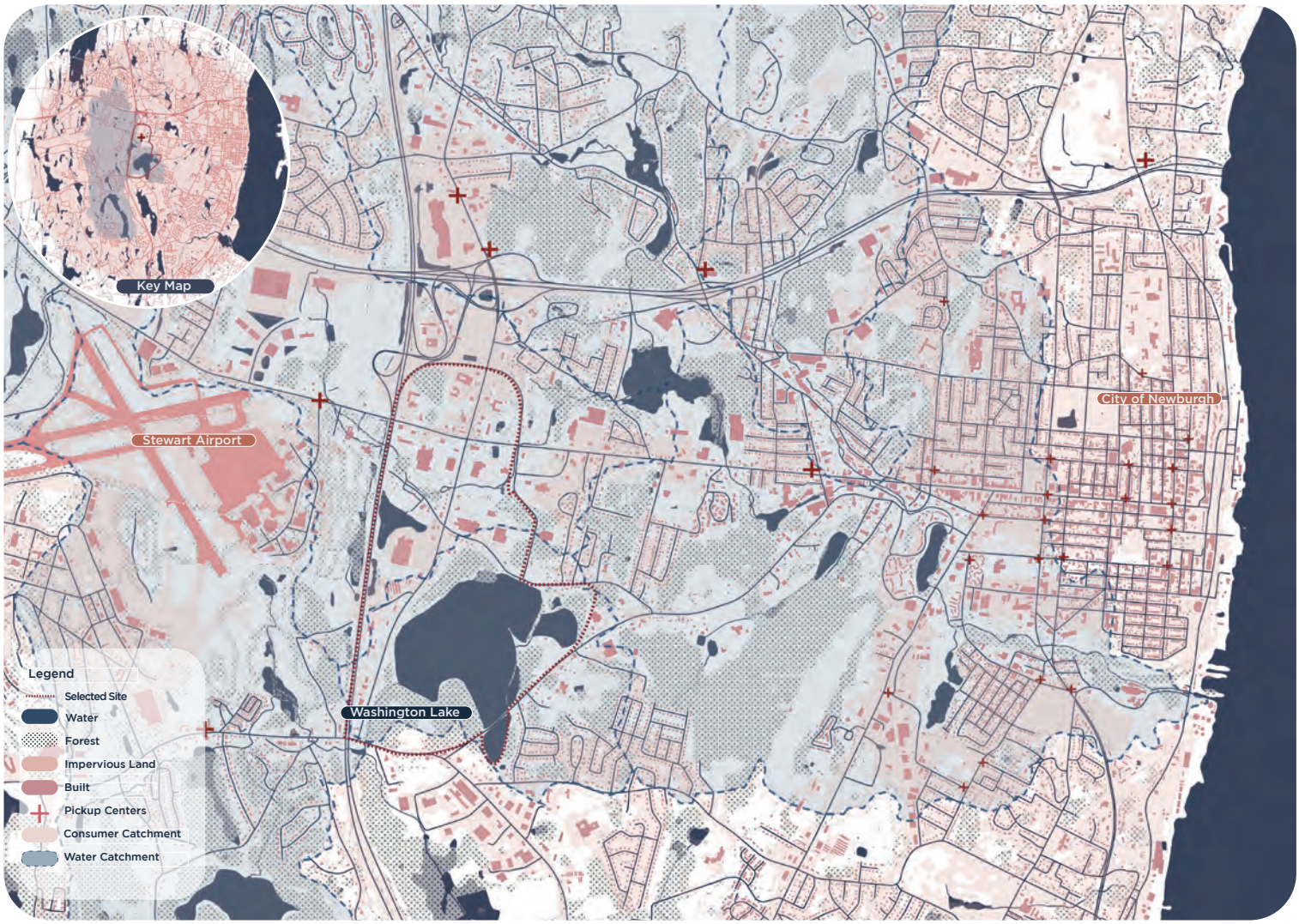
Hala Abukhodair, Scott Guo, Xinuye Liu, Stuti Ganatra

The proliferation of shopping centers in the 1960s, and the highways that sustained them, are now a burden to the social and ecological landscape of the suburbs. Forests were cleared and streams and ponds were canalized, if not covered over, to enable these places. In particular, the emergence of big box store complexes has continued to shape settlement and landscape patterns which today yield ever-increasing carbon footprints.

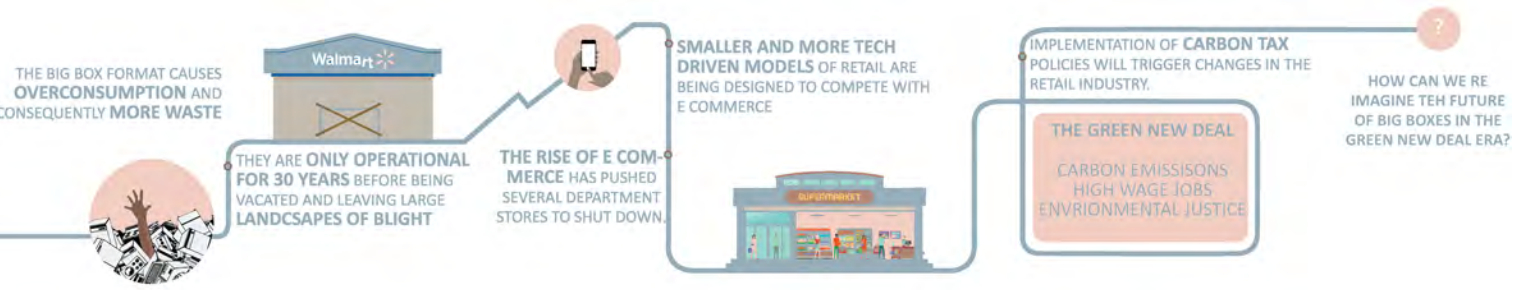
UNBOXED reimagines the spatial and social systems in and around the City of Newburgh to change the flows of commerce, distribution of goods, and the ecological flows of the region. The Big Box complex is disassembled into smaller parts, its ecosystem connections restores and, in the City, new systems of goods sales and delivery re-assert streets and stores as viable social places. Consumption in and outside of the city might be complementary.

See the project's video here:
https://vimeo.com/380156155

Site Map

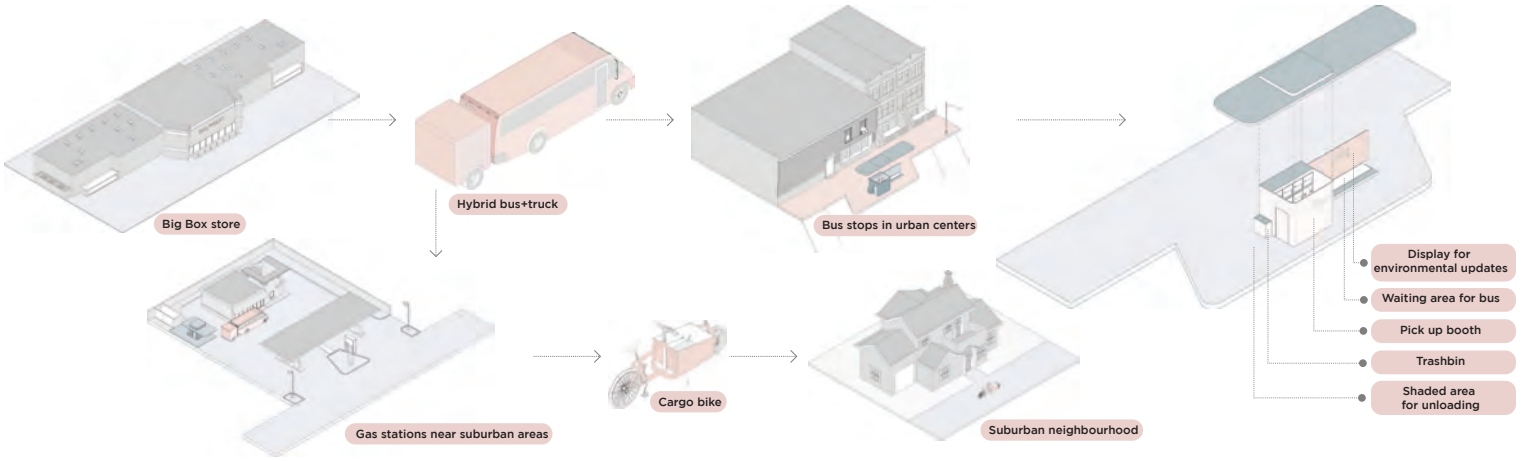


Existing edge conditions of water bodies and big box stores

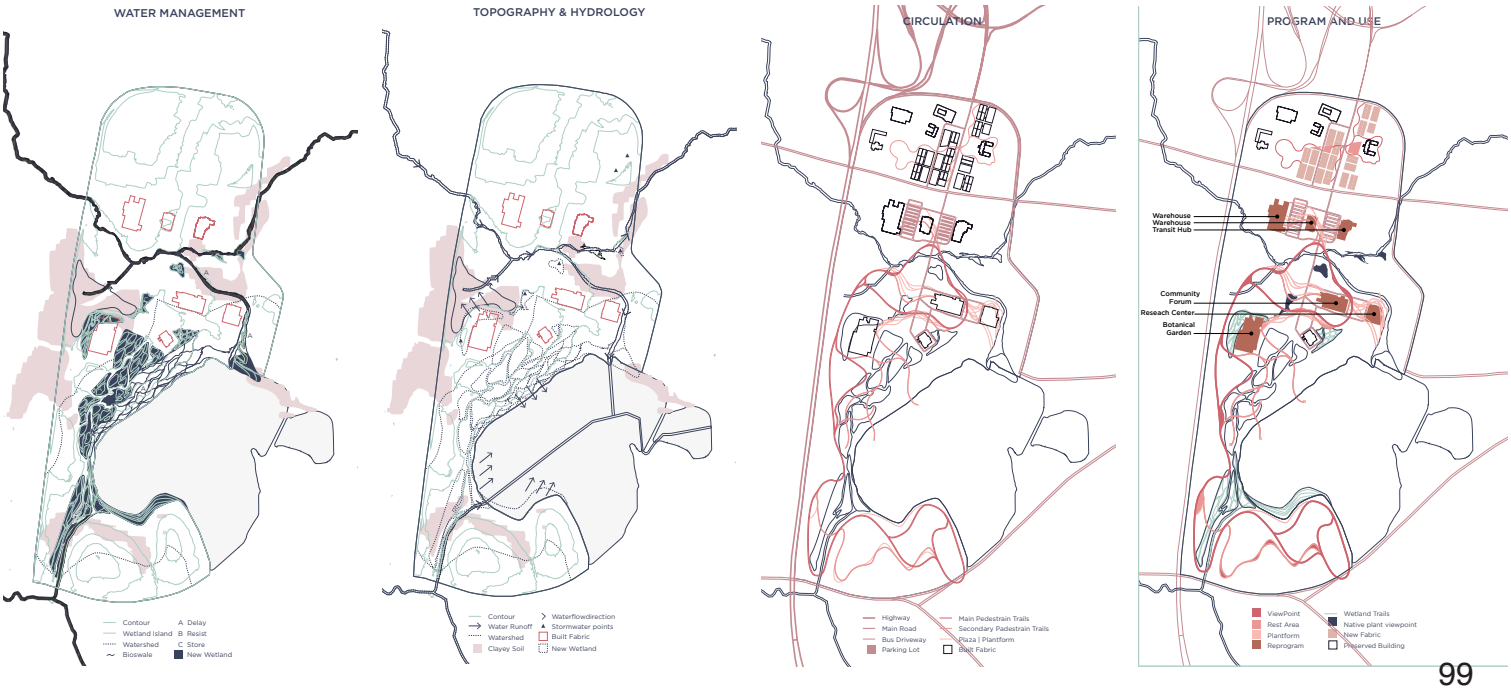


Design Goals

Pickup Center System



Site Strategies



1. Elevated Walkway

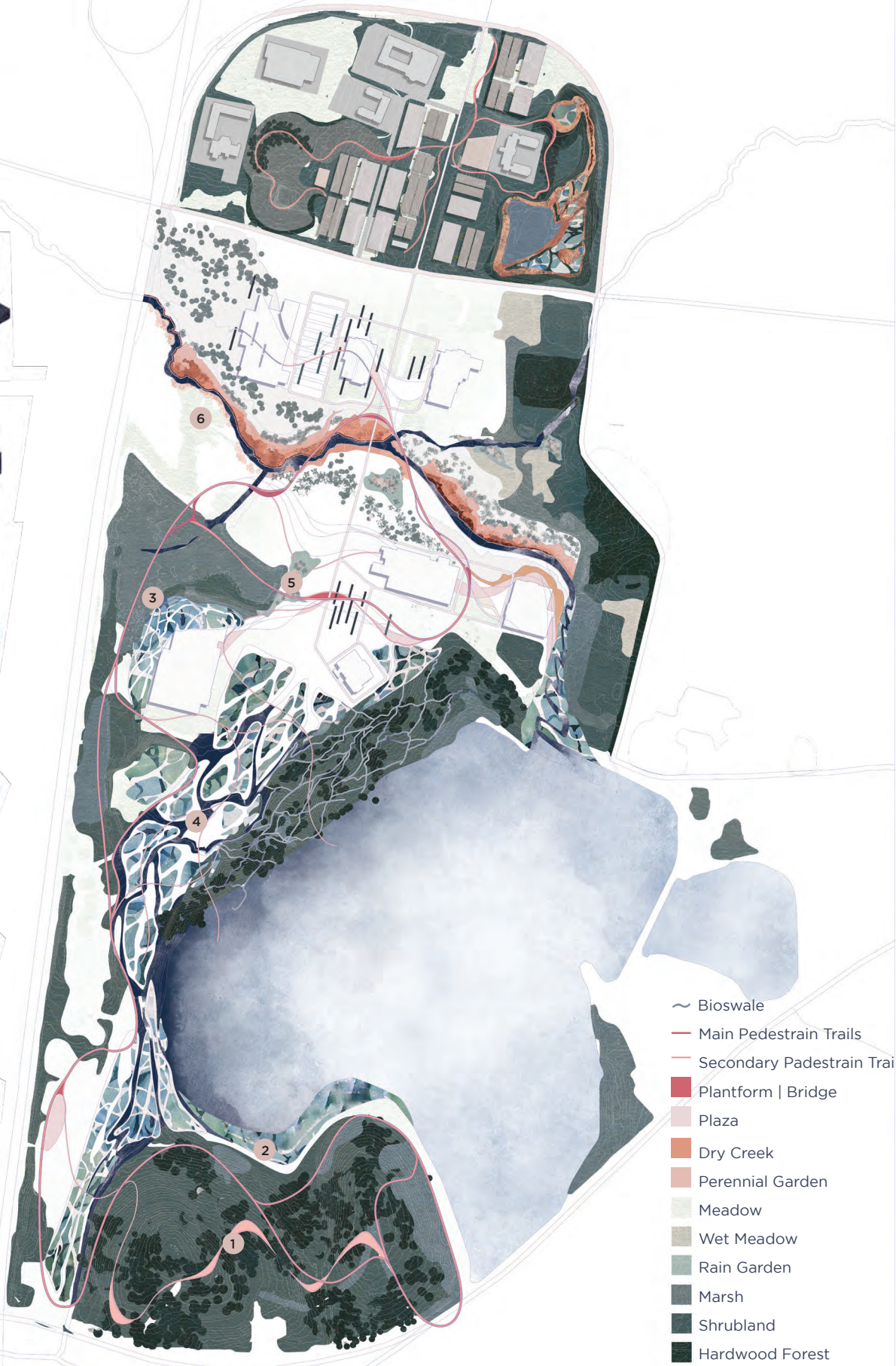
2. Terrace Edge

3. Detention Wetland

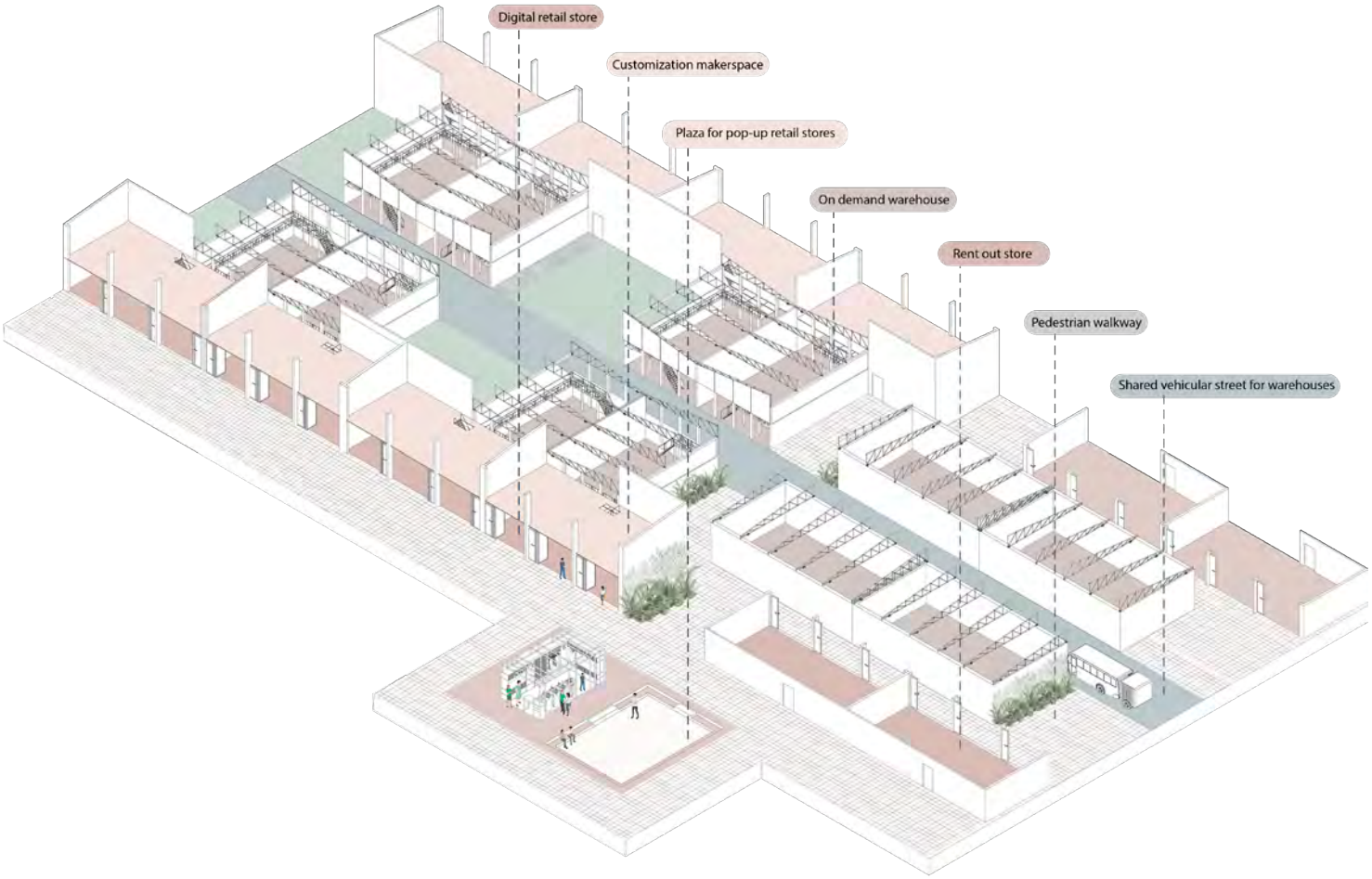
4. Retention Wetland

5. Rain Garden

6. Dry Creek



New Retail Strategy




Community Forum

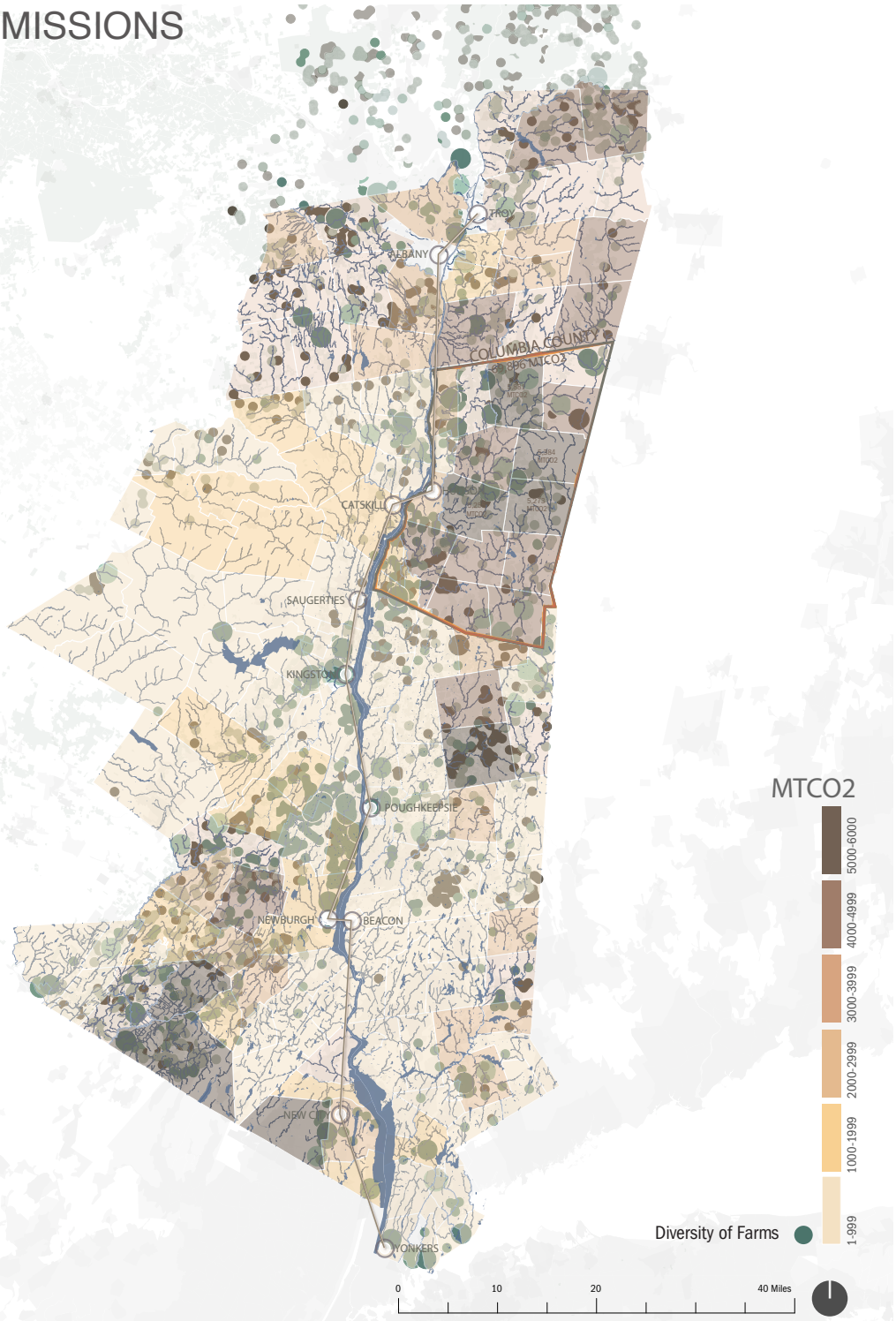

Botanical Garden

Transit Hub

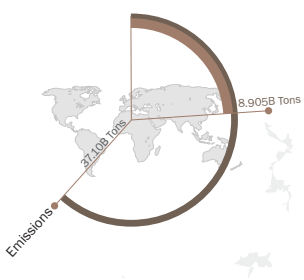

Pickup Center in Downtown Newburgh

FARMS AND FORESTS

GREENHOUSE GAS EMISSIONS FROM AGRICULTURE

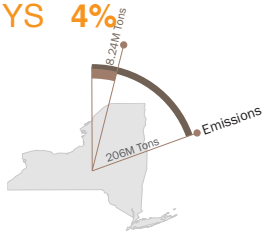


GLOBAL 24%

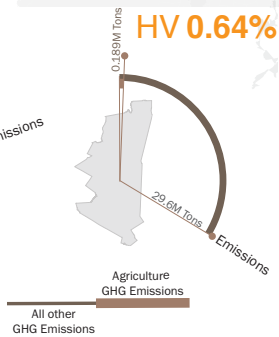


USA 9%

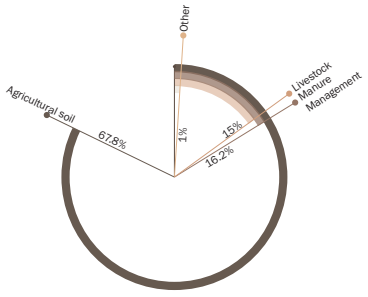
NYS 4%



HV 0.64%



EMISSIONS BY TYPE



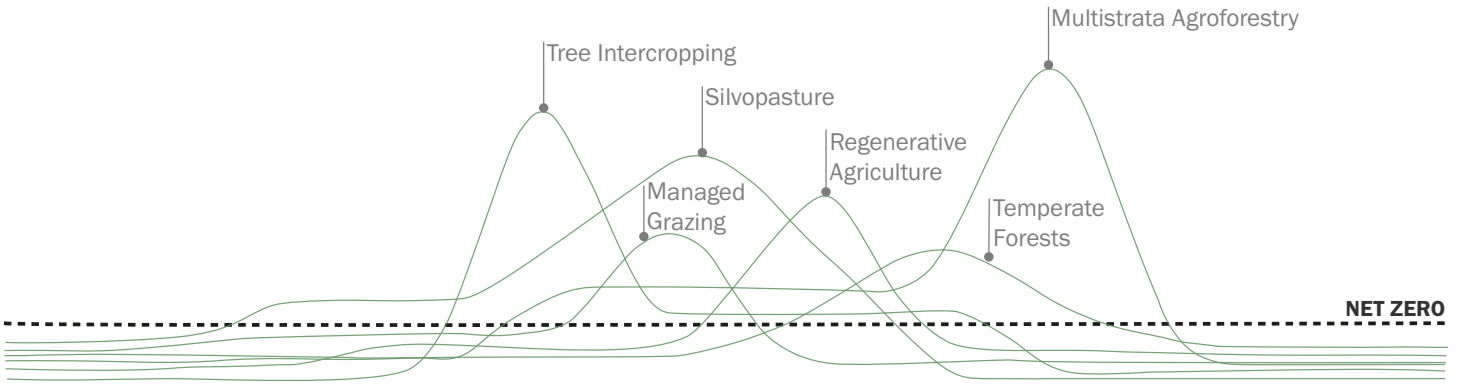
Migroculture

German Bahamon, Claudia Kleffmann, Nina Lish, Nina Ndichu,Angus Palmer.

Industrialized agriculture in the US is dramatically out of sync with the long term sustainability of land and the well-being of the people it is designed to feed. Instead of a system that entails chemicals and genetic manipulation, Regenerative Agriculture works with nature. Its practices rebuild soil, which leads to increased carbon storage, less need for nitrogen and herbicides, less erosion or flooding, healthier water systems, and, most important, healthier food. Part of a healthier farming system actually depends on livestock, appropriate pasture rotation and diverse crop management, all crucial to keeping land healthy.

MIGROCULTURE is a spatial system of negotiated and shared arterial routes for livestock in Columbia County. An easement system connects paddocks and harvested cropland so farmers can share land and develop social networks. Livestock are rotated through the trail and paddocks to regenerate the land and sequester carbon. Local Main Streets, schools, and recreational opportunities are part of the new route system to create new audiences for the re-imagined landscape.

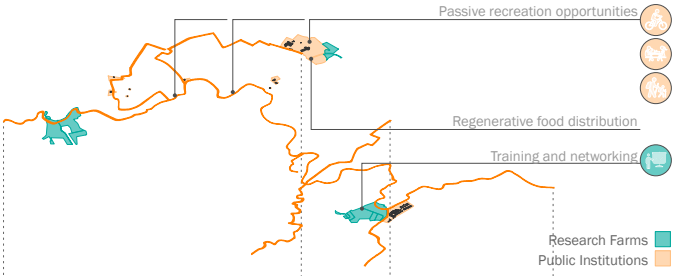
See the project's video here:
https://vimeo.com/380154441



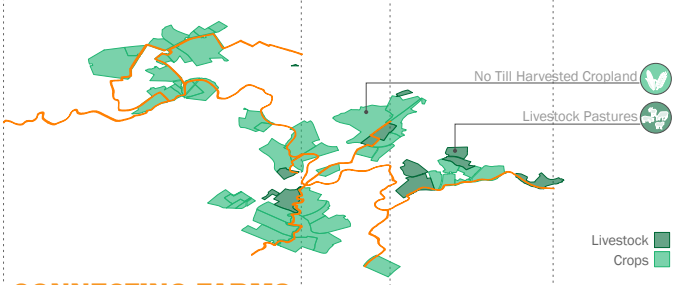
BENEFITS OF **RESILIENT** FARMING PRACTICES

MIGROCULTURE

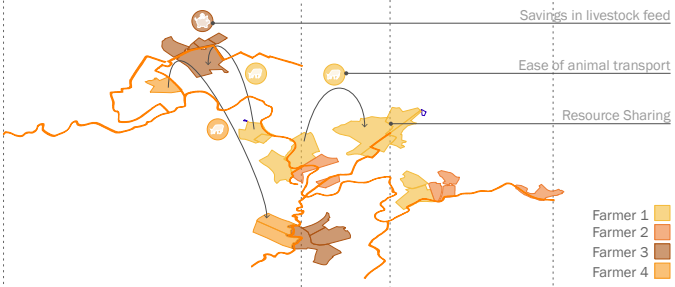
VALATIE AND KINDERHOOK CASE STUDIES



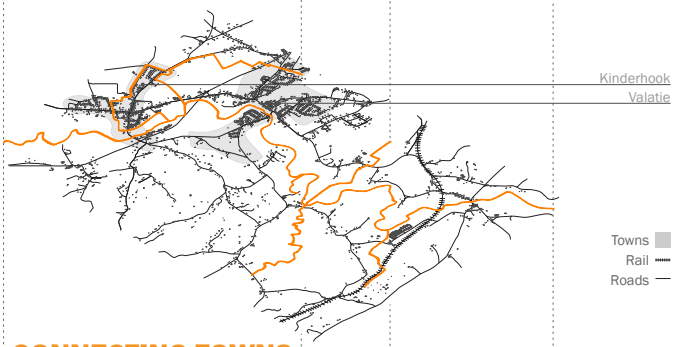
INSTITUTIONAL OPPORTUNITIES



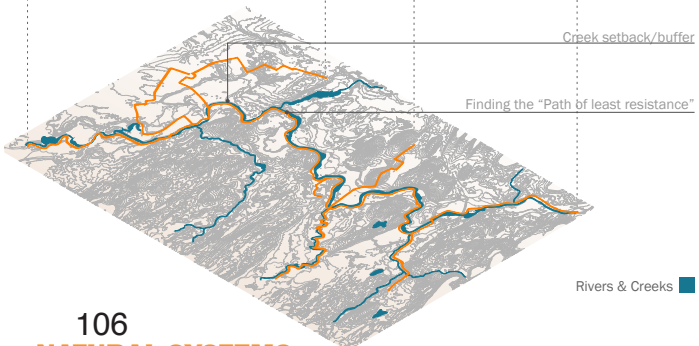
CONNECTING FARMS



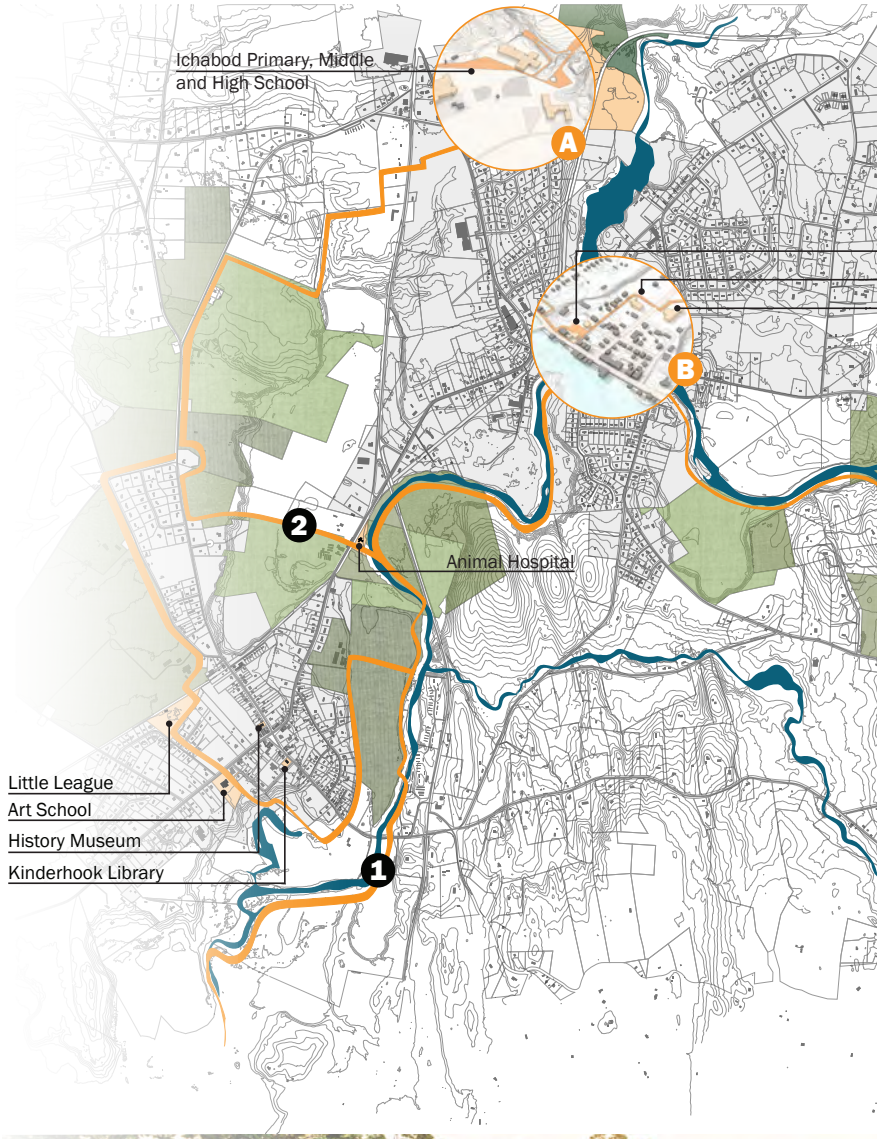
RURAL COLLABORATION

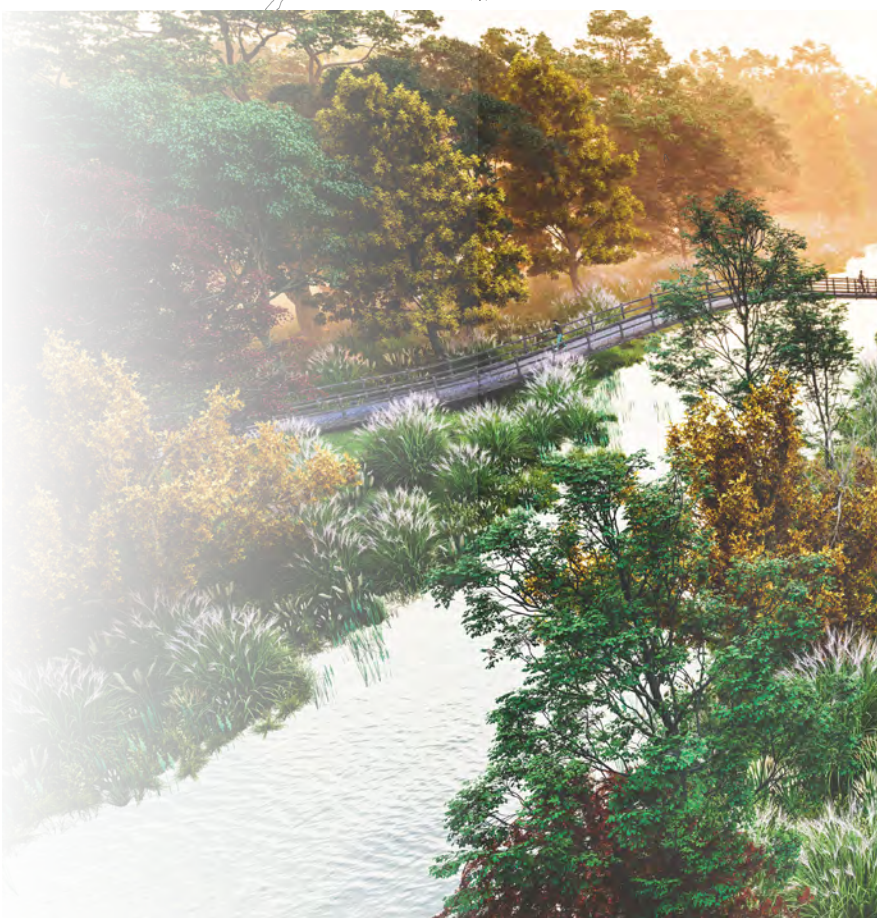


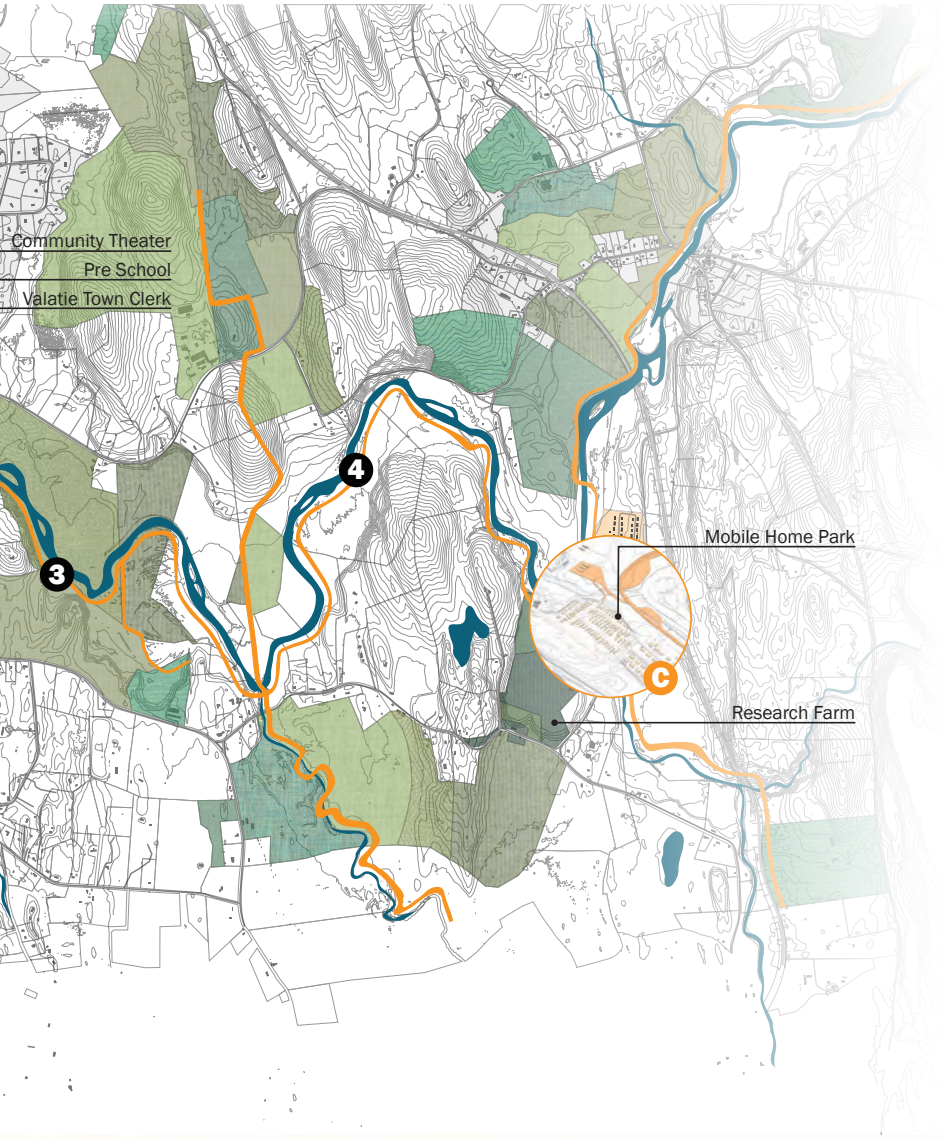
CONNECTING TOWNS

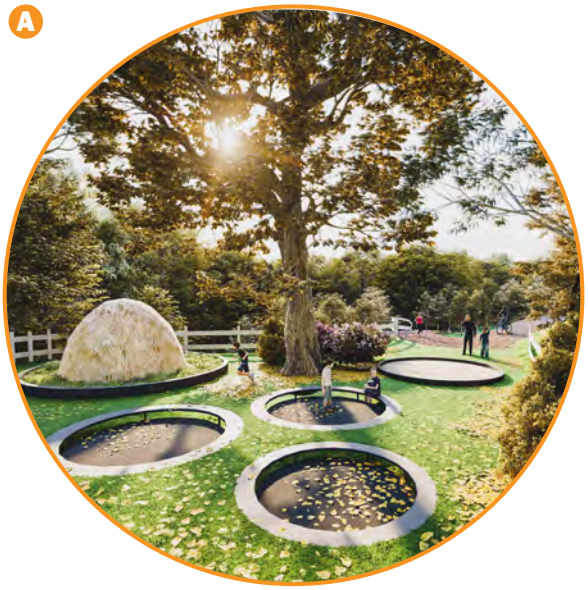


NATURAL SYSTEMS





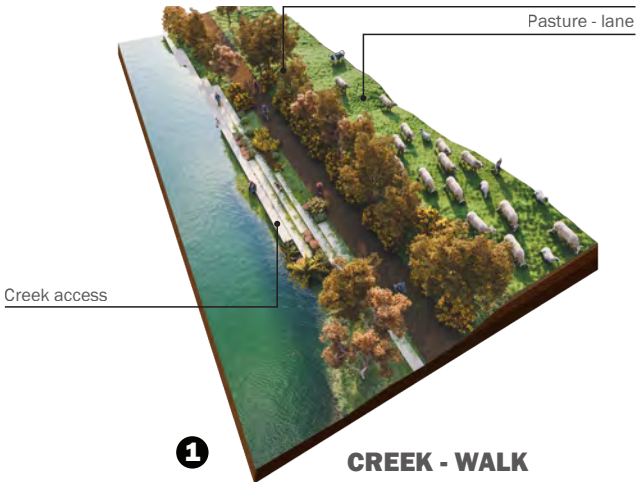




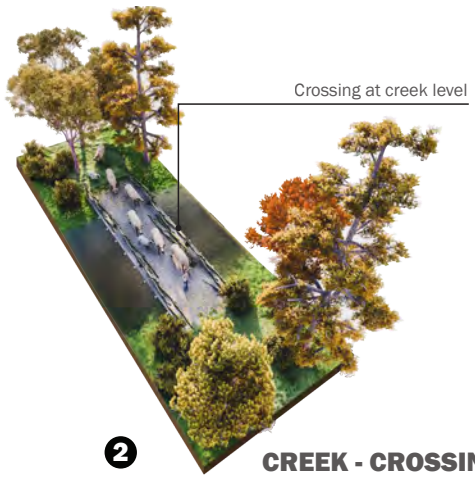
FARM + INSTITUTIONS

VALATIE MAIN STREET

TRAINING CENTER



1 **CREEK - WALK**



2 **CREEK - CROSSING**

3

PICNIC MARKET: SHOP AND EAT

BIKE STATION: REST AND PUMP

A JUST TRANSITION
ECONOMIC MODEL

TOP DOWN FUNDING

A new Co-operative is established to manage Regenerative Network

$

ADD POULTRY

EDUCATIONAL WORKSHOPS

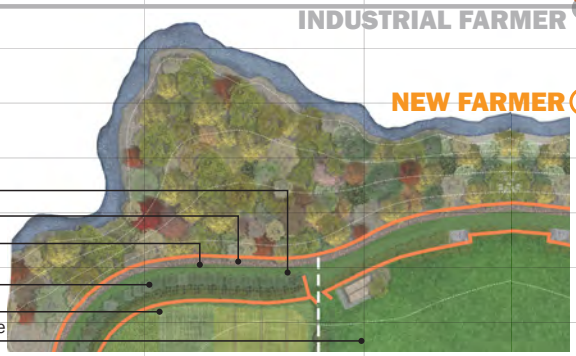
SELL FARM MACHINERY

FARMERS PARTNER

TRANSITIONING FARMER

INDUSTRIAL FARMER

NEW FARMER

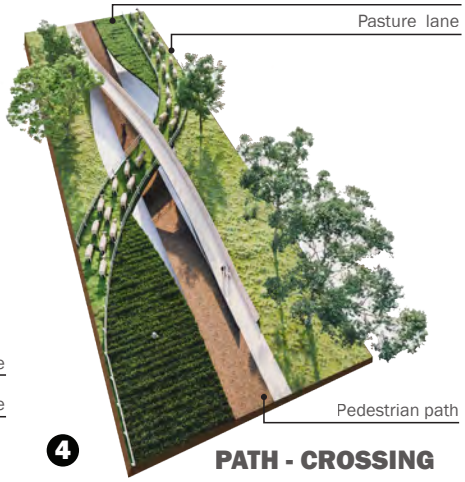


PLANNING AND INVESTMENT
EARLY AGROBUSINESS RETURNS

TRANSIT
PLAN AND COMMEN

TODAY

REGULAR SECTION

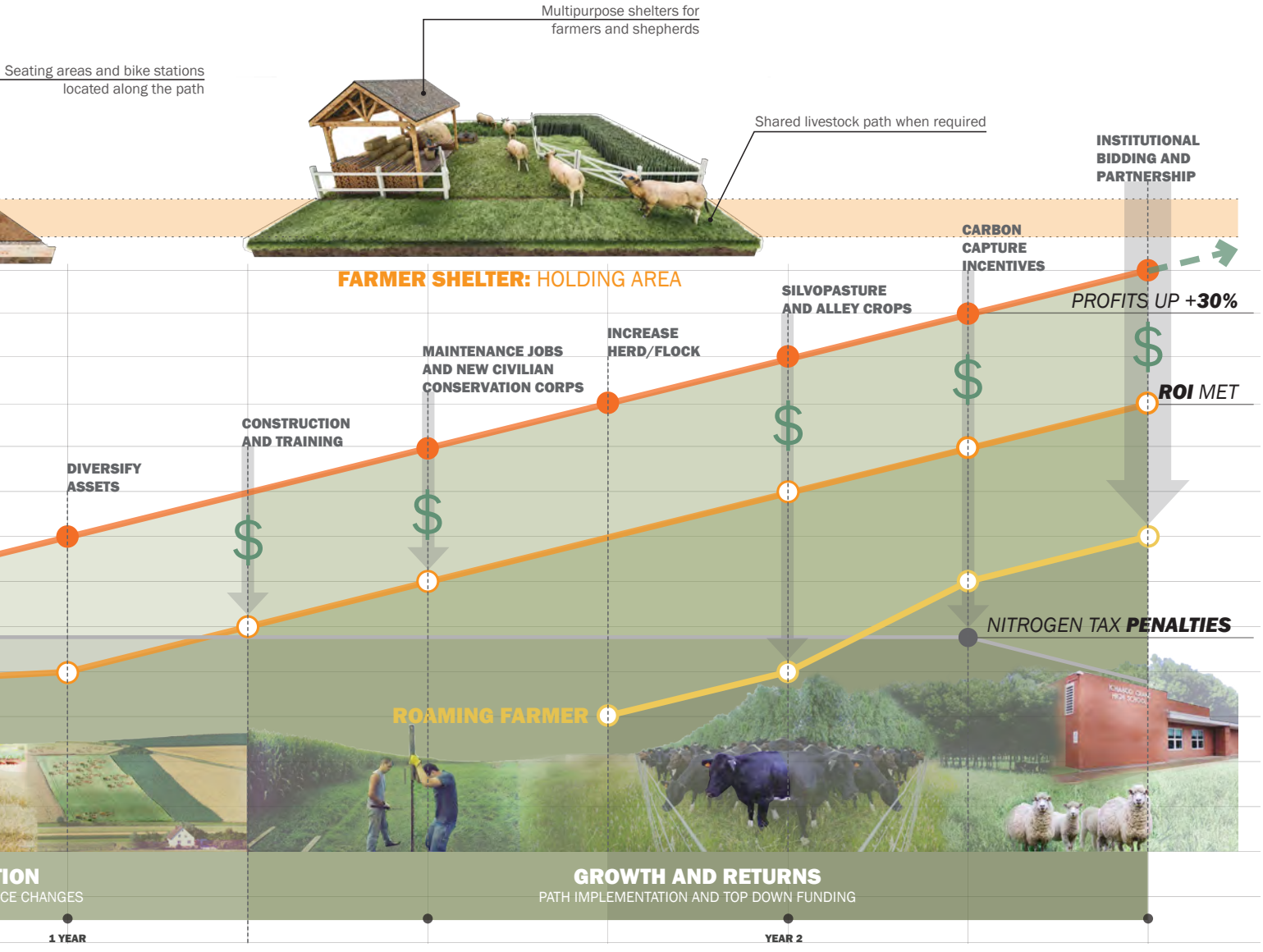


4

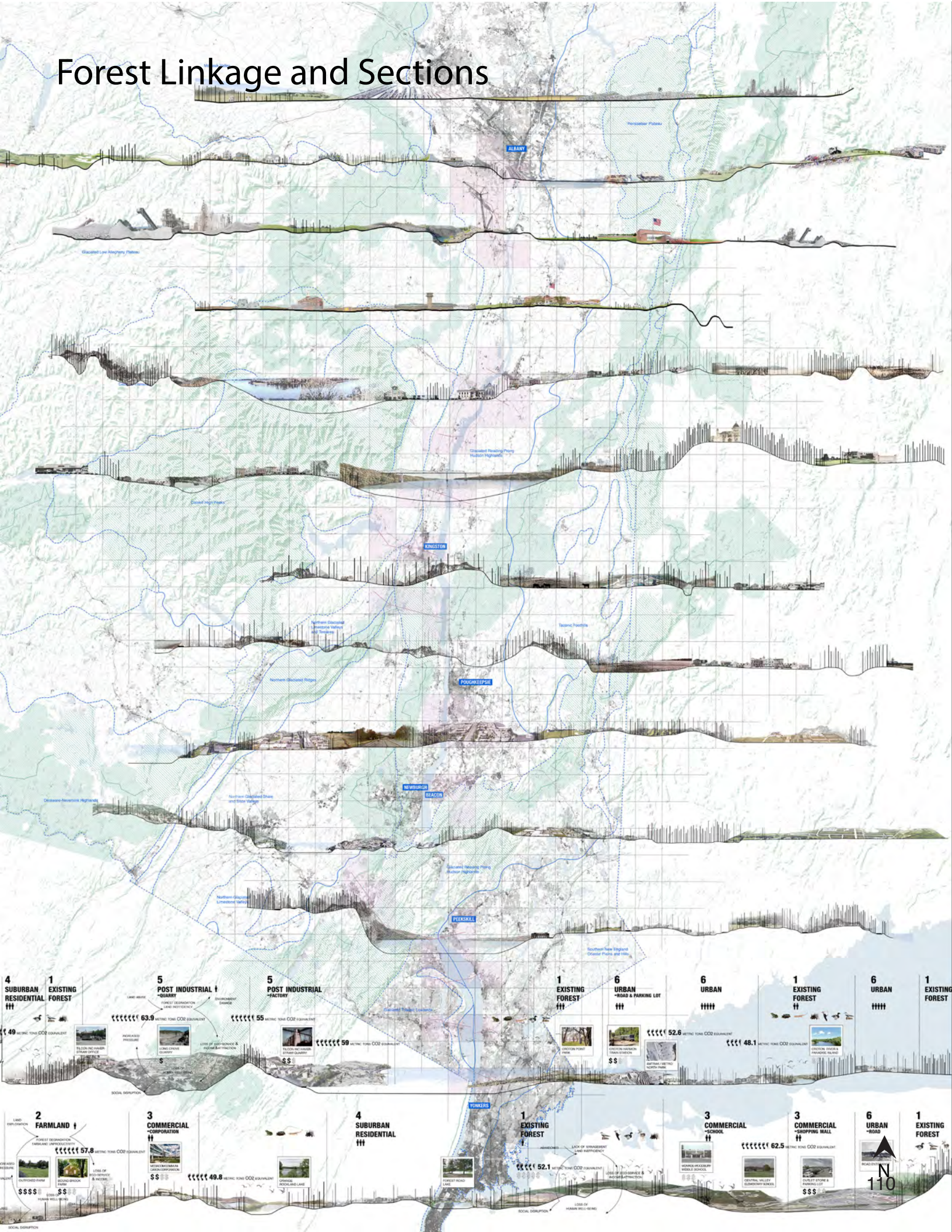
PATH - CROSSING

WINTER RECREATION

PATH DESIGN



Forest Linkage and Sections



Carbon Sequestration

Menghan Zhang, Tian Hao, Kuan-I Wu, Eleni Stefania Kalapoda

A tree is a carbon machine that can store huge amounts of carbon. Writ large, reforestation is a cost-efficient, nature-based means of offsetting carbon emissions while also contributing to a vast new social infrastructure. Currently, 74% of the Hudson Valley is forested yet frequently this forested land is fragmented by urban development negatively impacting biodiversity and species migration.

CARBON SEQUESTRATION is a long-term plan to reforest and reconnect forests in the Kingston region as a case study for the larger region. Placing new tree nurseries and planting areas on previously industrial sites, a renewed and more connected forest landscape will create a regional carbon sink – a huge environmental as well as recreational asset. Beyond the trees, however, the reforestation project entails considerable management and maintenance over time, including planting, harvesting, grounds work, and potential for research and innovation in the timber industry, all creating a vast array of skills and jobs for local communities.

See the project's video here:
https://vimeo.com/380159938

POTENTIAL FOREST

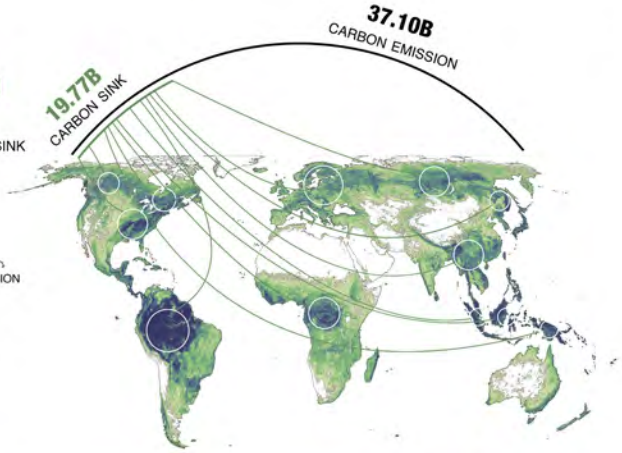
0.9B HECTARES OF FOREST ×1

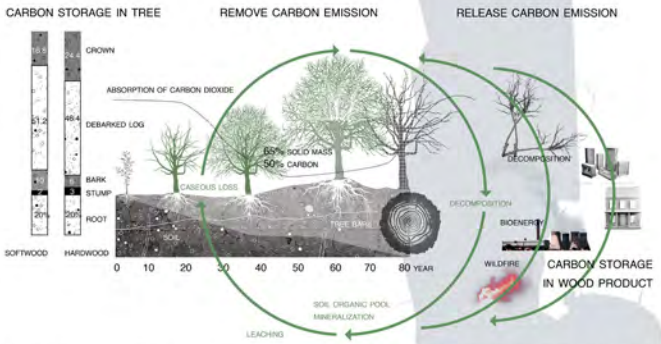
POTENTIAL CARBON SINK

205B TONS OF CARBONS

2/3 MAN-MADE CARBON EMISSION

1.5°C LIMIT GLOBAL WARMING





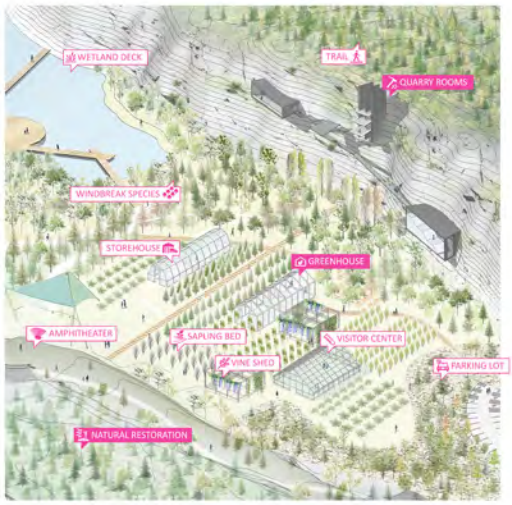
CARBON SEQUESTERED PER TREE (KG) =TREE FRESH BIOMASS X 65% (DRY MASS) X 50% (CARBON %) X 3.67 X 120%

ESTIMATED 217KG CO_2 PER TREE PER YEAR

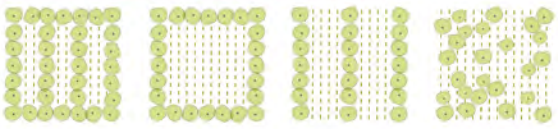
EXISTING FOREST
PROPOSED FOREST
AGROFORESTRY
URBAN FOREST
CHOSEN SITE
RECIEVING-PROVIDING FLOW
RECIPIENT AREA

MODEL FOREST
PROVIDER & EDUCATION
RIPARIAN BUFFER
SECONDARY WOOD PRODUCT
SELF-SUFFICIENT AGROFORESTRY
FARMLAND
OVERSIZED PARKING LOTS
RECIPIENTS
NURSERY
SUPPLIER
RESEARCH & PRODUCT
VACANT LOTS
GREENWAY
WOOD INOVATION HUB

BLUESTONE WILD



AGROFORESTRY UNDER VARIOUS SPATIAL ARRANGEMENT WITH DIFFERENT SPECIES

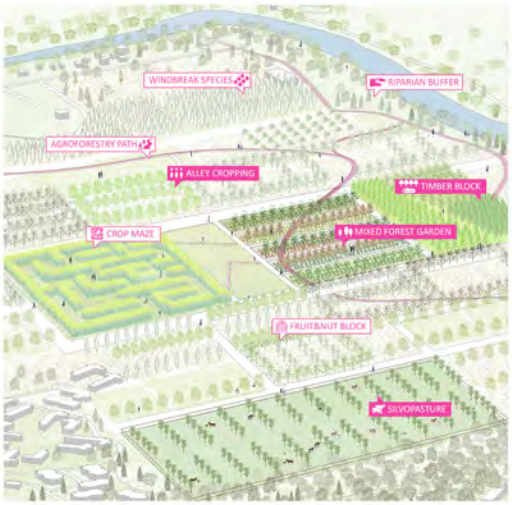


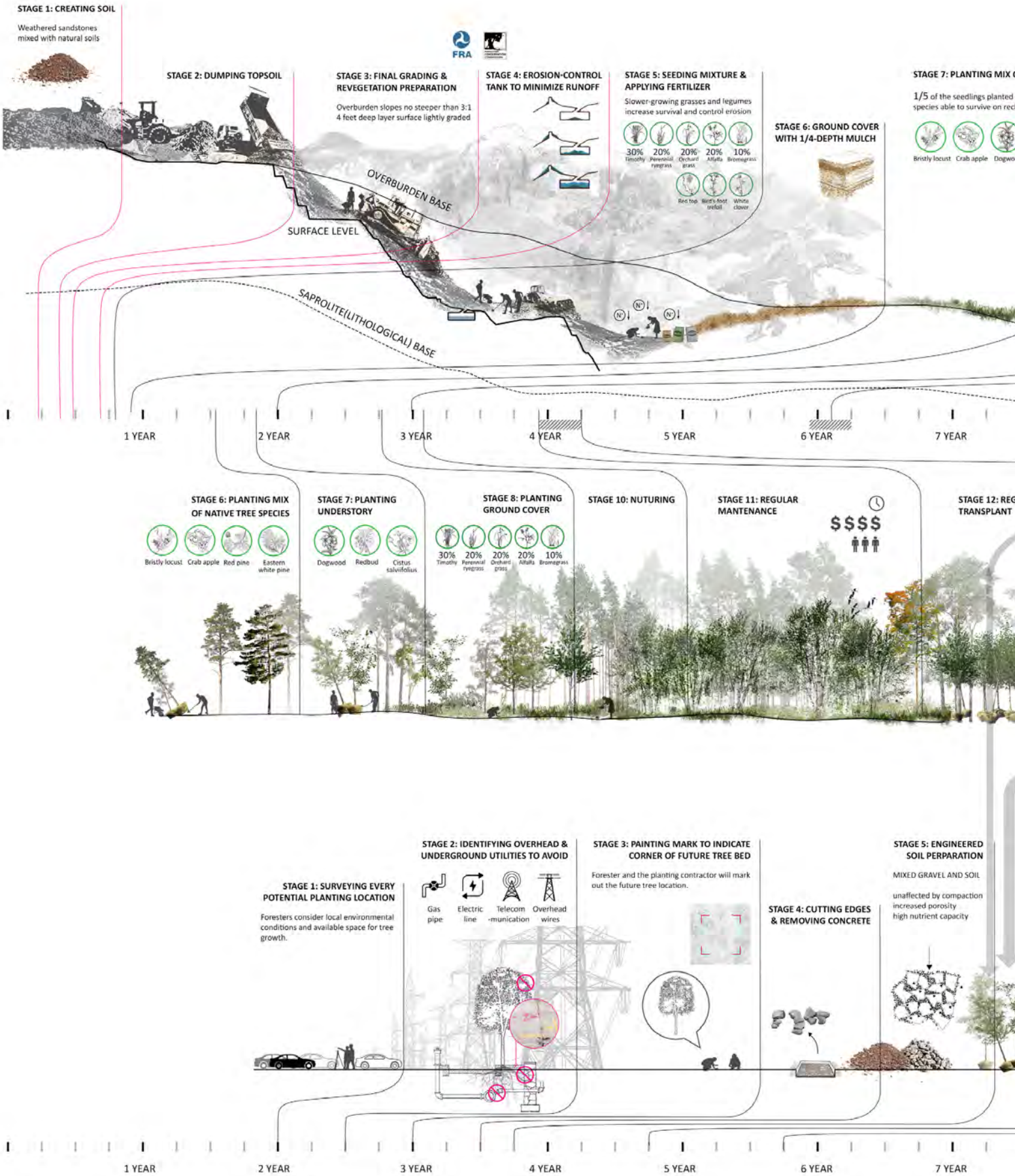
SILVOPASTURE ROW FOR ROTATIONALLY GRAZED ANIMALS

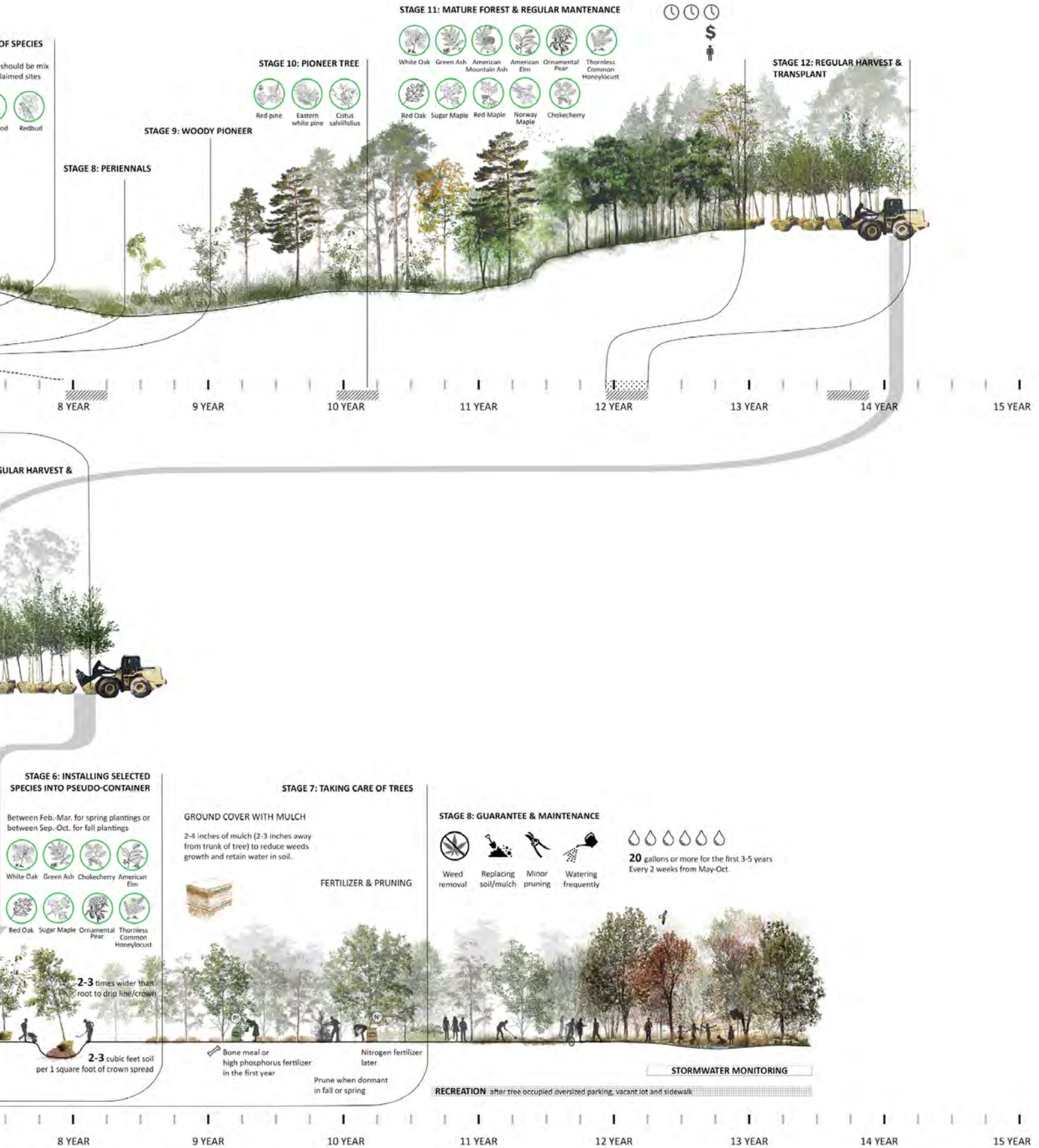
TREES ALONG BORDERS OF CROP FIELD

ALLEY CROPPING FOR FRUIT & NUT BLOCK

MIXTURE IN FOREST GARDEN FOR FARMLAND TOURISM




STAGE 1: CREATING SOIL
Weathered sandstones mixed with natural soils
STAGE 2: DUMPING TOPSOIL
STAGE 3: FINAL GRADING & REVEGETATION PREPARATION
Overburden slopes no steeper than 3:1
4 feet deep layer surface lightly graded
STAGE 4: EROSION-CONTROL TANK TO MINIMIZE RUNOFF
STAGE 5: SEEDING MIXTURE & APPLYING FERTILIZER
Slower-growing grasses and legumes increase survival and control erosion
30% Timothy
20% Perennial ryegrass
20% Orchard grass
20% Alfalfa
10% Bromegrass
Red top
Bird's-foot trefoil
White clover
STAGE 6: GROUND COVER WITH 1/4-DEPTH MULCH
STAGE 7: PLANTING MIX
1/5 of the seedlings planted
species able to survive on red
Bristly locust
Crab apple
OVERBURDEN BASE
SURFACE LEVEL
SAPROLITE(LITHOLOGICAL) BASE
1 YEAR
2 YEAR
3 YEAR
4 YEAR
5 YEAR
6 YEAR
7 YEAR
STAGE 6: PLANTING MIX OF NATIVE TREE SPECIES
Bristly locust
Crab apple
Red pine
Eastern white pine
STAGE 7: PLANTING UNDERSTORY
Dogwood
Redbud
Cistus salvifolius
STAGE 8: PLANTING GROUND COVER
30% Timothy
20% Perennial ryegrass
20% Orchard grass
20% Alfalfa
10% Bromegrass
STAGE 10: NUTURING
STAGE 11: REGULAR MANTENANCE
$$$$
STAGE 12: REG
TRANSPLANT
STAGE 1: SURVEYING EVERY POTENTIAL PLANTING LOCATION
Foresters consider local environmental conditions and available space for tree growth.
STAGE 2: IDENTIFYING OVERHEAD & UNDERGROUND UTILITIES TO AVOID
Gas pipe
Electric line
Telecom -munication
Overhead wires
STAGE 3: PAINTING MARK TO INDICATE CORNER OF FUTURE TREE BED
Forester and the planting contractor will mark out the future tree location.
STAGE 4: CUTTING EDGES & REMOVING CONCRETE
STAGE 5: ENGINEERED SOIL PERPARATION
MIXED GRAVEL AND SOIL
unaffected by compaction
increased porosity
high nutrient capacity
1 YEAR
2 YEAR
3 YEAR
4 YEAR
5 YEAR
6 YEAR
7 YEAR


OF SPECIES
should be mix
laimed sites
od
Redbud
STAGE 10: PIONEER TREE
Red pine
Eastern white pine
Cistus salviifolius
STAGE 11: MATURE FOREST & REGULAR MANTENANCE
White Oak
Green Ash
American Mountain Ash
American Elm
Ornamental Pear
Thornless Common Honeylocust
Red Oak
Sugar Maple
Red Maple
Norway Maple
Chokecherry
$
STAGE 12: REGULAR HARVEST & TRANSPLANT
STAGE 9: WOODY PIONEER
STAGE 8: PERIENNALS
8 YEAR
9 YEAR
10 YEAR
11 YEAR
12 YEAR
13 YEAR
14 YEAR
15 YEAR
GULAR HARVEST &
STAGE 6: INSTALLING SELECTED SPECIES INTO PSEUDO-CONTAINER
Between Feb.-Mar. for spring plantings or between Sep.-Oct. for fall plantings
White Oak
Green Ash
Chokecherry
American Elm
Red Oak
Sugar Maple
Ornamental Pear
Thornless Common Honeylocust
2-3 times wider than root to drip line/crown
2-3 cubic feet soil per 1 square foot of crown spread
STAGE 7: TAKING CARE OF TREES
GROUND COVER WITH MULCH
2-4 inches of mulch (2-3 inches away from trunk of tree) to reduce weeds growth and retain water in soil.
FERTILIZER & PRUNING
Bone meal or high phosphorus fertilizer in the first year
Nitrogen fertilizer later
Prune when dormant in fall or spring
STAGE 8: GUARANTEE & MAINTENANCE
Weed removal
Replacing soil/mulch
Minor pruning
Watering frequently
20 gallons or more for the first 3-5 years
Every 2 weeks from May-Oct.
STORMWATER MONITORING
RECREATION after tree occupied oversized parking, vacant lot and sidewalk
8 YEAR
9 YEAR
10 YEAR
11 YEAR
12 YEAR
13 YEAR
14 YEAR
15 YEAR

THANK YOU

Dan Almasi, Columbia County Mental Health

Robert William Balder, Cornell AAP

Nancy Barton, Prattsville Art Center (Greene County)

Thomas H. Benton, Lawyer Kingston Land Trust

Gabe Berlin, Newburgh Transportation Advisory Committee

Micah Blumenthal, Good Work Institute

Jesse Brown, Hudsy TV

Ellie Burhans, Hudson River Maritime Museum

Kevin Burke, Hudson Valley Greenway Initiative

David Church, Planning Commisioner Orange County

Brendan Clemente, Bonded Concrete

Jean-Paul Courtens, Roxbury Farm

Pat Courtney-Strong, Activist, Kingston

Mike Cotrone, Bonhomie Farm

Miles Crettien, CommonShare.app

Paul Daley, Hudson River Maritime Museum

Dennis Doyle, Planning Ulster County

Jonathan Drapkin, Hudson Valley Pattern For Progress

Tony DiMarco, Global Center for Social Entrepreneurship Network

Tom Eberhardt, Bastoy Prison (Norway)

Bob Elliott, Hudson River Greenway

Julia Farr, Kingston Land Trust

Evelyn Garcia, Lenox Hill Neighborhood House

Iona Gitt-Henderson, Churchtown Dairy

Anthony Grice, Newburgh Council

Robert Glowacki, Horizon-on-the-Hudson Magnet School

Robert (Roman) Haferd, Restorative Justice Coordinator, District of Columbia

Paul Halayko, Newburgh Brewing Company

Laura Hartmann, Town of Ulster Citizens

Kristina Hayek, NY State Parks/Bear Mountain

Naomi Hersson-Ringskog, Newburgh Transportation Advisory Committee

Paul Hesse, Community Development Coordinator, City of Poughkeepsie

Liana Hoodes, Newburgh Urban Farm and Food

Leon Johnson, Lodger Newburgh

Virginia Kasinki, Newburgh Urban Farm and Food

Martin Kirk, NOVO Foundation

Evelina Knodel, Mass Design Group

Chris Kroner, Mass Design/ Poughkeepsie

Gabe Landes, Cottonwood Energy

Barbara Lee, A River of Opportunities

Abdus Miah, Supervisor, Columbia County 2nd Ward, City of Hudson

Otto Ohle, Film Maker

Claire Parde, Columbia County Community Healthcare Consortium, Inc

Michael Parker, Hudson Valley Young Farmers

Jeffrey Potent, Columbia University, The Earth Institute

Lee Ranney, Kinderhook Farm

Rebeca Ramirez, Cold Spring Cheese Shop

Anna Remet, Kingston Resident

Ezra Ritchin, The Bail Project (USA)

Bryn Roshong, Hudson Valley Young Farmers

Ari Rosmarin, ACLU Smart Justice Campaign

Jennifer Schwartz Berky, Planner, Ulster County

Rita D. Shaheen, Scenic Hudson, Poughkeepsie

Matt Shepard, Stone House Grain

Michael Shiffer, Metro North/MTA

Andrew Shrijver, Newburgh Property Owner

Darius Sollohub, New Jersey Institute of Technology

Conor Stedman, Appleseed Permaculture

Kevin Sylvester, Chief of Ossining Police

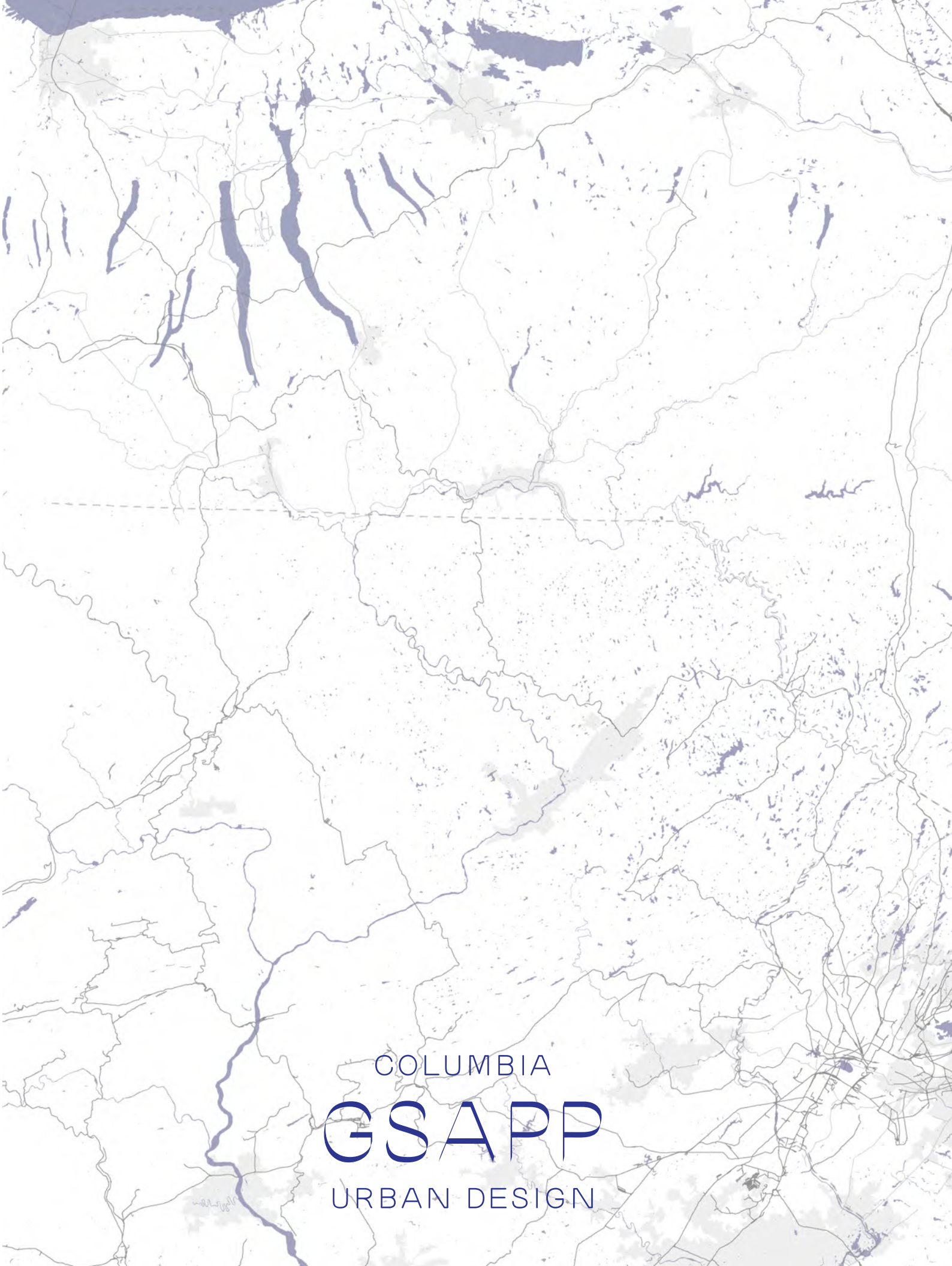
Michele Washington, Design Researcher

June Williamson, Spitzer School of Architecture CUNY

Evelyn Wright, Commonwealth Hudson Valley

Columbia GSAPP Urban Design Class of 2019

This publication has been produced through the Urban Design Program, and the Hudson Valley Initiative at Columbia University GSAPP.



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