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

The Hudson Valley Regional Studio

Fall 2019

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THANK YOU
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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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
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
State Waste and Recycled Material Manufacturing Potential

Wasted During Construction Demolition Debris

230 Jobs in Recycling
4x the Demolition Jobs
600 Jobs in Production

Recycled Material Manufacturing Can Save:
844,000 Tons of CO₂

Construction and Demolition Waste
970,000 Tons of Waste

What if we recycled that?

Legend
- Suburban
- Urban
- Freight Rail
- Mine

Local Extracted Materials

Brick
Stone
Cement
Gravel

Digging
Carving
Sorting

Hudson River Valley Building Industry

Population and Industry

Material Extraction

1875 1900 1925 1950 1975 2000

Post War Industrial Decline
Tech & Service

New York City Metropolitan Area

State Waste and Recycled Material Manufacturing Potential

Legend
- Suburban
- Urban
- Freight Rail
- Mine

Construction and Demolition Waste
970,000 Tons of Waste

What if we recycled that?

Recycled Material Manufacturing Can Save:
844,000 Tons of CO₂

600 Jobs in Production
230 Jobs in Recycling
4x the Demolition Jobs
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
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

- Consolidated Transportation
- On Site Material Sourcing
- Encouraging Closed Loop Manufacturing
- Collaboration with Various Industries

High Quality Building Materials
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
Green House

- Biobime
- Glass Panels
- Floor Harvest
- Vertical
- Hydroponics

System Axonometric

- Biodome
-kon
- Surfacing Transportation
- Interior Transportation
- Parking Lots

Research Center

- Concrete Shell Structure
- Library/Reading Room
- Administration
- Laboratory
- Research Room
- Library
- Herbarium
- Exhibition Area
- Demonstration Lab
- Classroom

- Biodome
- Glass Panels
- Floor Harvest
- Vertical
- Hydroponics

- Bike Lane
- Surfacing Transportation
- Interior Transportation
- Parking Lots

- Research Center
- Sport Field & Playground
- Visitors & Work Spaces
- Entry Heuristics
- Manufacturing
- Affordable Housing

- Phase 1
- Phase 2
- Phase 3
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
Callanon Industries
Quarry

Capacity of Quarry

- Limestone
- Coal Measures
- Permian Sand
- Marl Slate
- Limestone
- Sandstone

Existing Condition and Capacity

1. Existing Condition and Capacity

2. Cleaning the Quarry

Chemically Cleaning the Quarry

- Boulders on steep edges
- Filling with Natural Soil

Cleaning the Quarry for Revitalization

Naturally Occurring Wetlands
Water Collection from Lake and Rainwater

Soil Layer

- Emerged
- Floating
- Submerged

Planting the Native Plants

- Southern naiad
- Coontail
- Leafy pondweed
- Star duckweed
- Southern naiad

Zosterella dubia
(Water stargrass)

3. Restoration/Adding of damaged Ecology and Habitats

SITE WATER AND ECOLOGY SYSTEM

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 to use for renewable energy

2027

Lake Kafrine
Existing Water Source

Riparian Buffer Zone

Collection Water in the revitalized Quarry

Existing mined connection

Quarry for Reservoir for Hydro power Plant

WETLAND AROUND QUARRY

VIEW FROM INSIDE HYDROELECTRIC PLANT (WINTER AND SUMMER)
URBAN FABRIC
Land Use Patterns and Carbon Emissions in the Hudson Valley

How to read this chart:
- Outer Ring: Carbon Emissions
- Center: Total Emissions (MT)
- Middle Ring: Land Use Type
- Inner Ring: Carbon Capture

Legend:
- Forest
- Wetland
- Agricultural Land
- Urban Area
- Open Water
- Open Areas

Kingston
Carbon Exchange

- Hudson
- Catskill
- Poughkeepsie
- Newburgh
- Beacon

Calculations:
- Hudson: -1,196,786
- Catskill: 40,946
- Poughkeepsie: -1,196,786
- Newburgh: -652,866
- Beacon: -183,910

Total Carbon Exchange: -437,055

18.8%
42.3%
7.7%
7.7%
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
Using Vacant Lots
Community Workshops
Green Jobs
Electric Station
Community Garden

Using Abandoned Quarry
Community Garden

Using Vacant Lots
Aging Houses

Restoring Wetland
Electric Station

Connection to Nature
Community Greenspace Community Marketplace

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

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

"... 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...

"... to create millions of good, high-wage jobs"

"... upgrading all existing buildings"

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

NET ZERO REGENERATION
"... to create millions of good, high-wage jobs"
"... upgrading all existing buildings"
"... Overhauling transportation systems in the United States to remove pollution and greenhouse gas emissions from the transportation sector"

"... 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..."
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

Consumer Behavior and CO2e (kg per journey)

- The Traditional Shopping (3.1) + car -35% CO2e
- The Online Shopper (1.5) + computer
- The Modern + Impatient (3.3) - 51% prime
- One day delivery shoppers
Post Retail Scape
Evolution of Retail

New Model
Individual Retail

Old Model
Collaborative

Footprint Infrastructure Lower cost Collaboration Interaction Experience

Refurbished Malls & Big Boxes, Regional Service Infrastructures

Refurbished Malls, Renewable Energy Infrastructure

Railway Collective Logistical Corridor

Post Retail Scape
Evolution of Retail

Main street
Shopping malls
Online

Traditional Retail

E-commerce
**Street Extension | Collaborative Consumption**

- **4-5 BUSINESSES**
  Retail collaborative

- **Zoom in Collaborative Retail**

- **Street Extension**
  Collaborative Consumption

- **Policy**
  
  - **Location**
  - **State**
  - **Land Trust**
  - **Investment**
  - **Incentives**

- **25,600 W/ 2500 Sqft 60 lbs CO2**

- **2006 02 03 04 05 06 07 08 09 10**

- **Infrastructure**
  - **State**
  - **Land Trust**
  - **Revive**

- **Shared Space Platform**
  - **Renewable Energy & Waste platform**
  - **Experiences**
  - **Parks & Street Extensions**

- **5-8 BUSINESSES**
  Retail collaborative

- **Collaborative Retail**
  
  - **Renewable Energy System**
  - **Shared Working**
  - **Street Extension**
  - **Art Park**
  - **Shared Production**
  - **Shared Makers**
  - **Meeting booth**
  - **Shared Space**
  - **Bicycle Lane**
  - **Playground**
  - **Amphitheater**
  - **Repair Park**
  - **Park**
DESIGN SITE

EMISSION OF NEW YORK: 205.61 (MMtCO$_2$e)

EMISSION OF TRANSPORTATION: 36%

PRIVATE CARS: 70%

Carbon Emission (Metric ton/sq mile ·year):

- 50,000
- 30,000
- 10,000

Legend:
- Population Density
- 0.000000 - 0.000020
- 0.000021 - 0.000055
- 0.000056 - 0.000115
- 0.000116 - 0.000226
- 0.000227 - 0.000406
- 0.000407 - 0.000707
- 0.000708 - 0.001065
- 0.001066 - 0.004141
- 0.004142 - 0.029946

Population Density (Population/sq meter):

- 0.000000 - 0.000020
- 0.000021 - 0.000055
- 0.000056 - 0.000115
- 0.000116 - 0.000226
- 0.000227 - 0.000406
- 0.000407 - 0.000707
- 0.000708 - 0.001065
- 0.001066 - 0.004141
- 0.004142 - 0.029946

POUGHKEEPSIE

KINGSTON

NEWBURGH & BEACON

MIDDLETOWN

PEEKSILL
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
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
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 mass transportation is rather important to their daily lives. However, the existing stop is an old small glass pavilion, both condition and accessibility being poor. A giant parking lot is right next to the stop, making it more friendly to drivers rather than pedestrians.

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

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

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.
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PUBLIC BUILDINGS AND INSTITUTIONAL SYSTEMS
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
HEALTH CARE IN THE HUDSON VALLEY

HEALTHCARE SYSTEM CARBON EMISSIONS

4% Patient Transportation
12% Building energy (light, heating & cooling)
5% Other primary industries
3% Waste treatment
5% Pharmaceutical and chemical products
8% Other sector & services
9% Agriculture
11% Other manufacturing
13% Anesthetic gases and metered dose inhalers
32% Energy for production of plastic and electrical equipment

84% CO₂ comes from Health System supplies

GOALS:
LOWER THE ENVIRONMENTAL IMPACTS
ELIMINATE THE HEALTH DISPARITIES
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 9 million 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
RURAL AREA MODULAR SHED

8 X 8 X 10ft Column - 12
2 X 6 X 8ft Panel - 300
3 in X 3in Plain Steel
2-channel bar with 1/8 in - 30
I beam - 3

PUBLIC PROMENADE

STOREFRONT HEALTHCARE
PRATTSVILLE, GREENE COUNTY

FIRE STATION

ART CENTER

MUSEUM

POST OFFICE

FRESH MARKET

WEST TAGHKANIC

GERMANTOWN

CHATHAM

GREENVILLE

ROUND TOP

HEALTHCARE CENTER

SHELD AS A LIVING ROOM
FOOD SYSTEM IS RESPONSIBLE FOR 25% OF CARBON EMISSIONS

MEAT AND DAIRY ACCOUNT FOR 14.5% OF THE CARBON EMISSIONS

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

POPULATION 28,444
POVERTY RATE 31.2%
AVERAGE AGE 27.9
SINGLE POPULATION 63%
UNEMPLOYMENT RATE 8%
K-12 PUBLIC SCHOOL STUDENTS 10,745

Public School Locations
Food Desert Zone
0%-27% Students Having Free / Reduced-Price Lunch
28%-46% Students Having Free / Reduced-Price Lunch
47%-95% Students Having Free / Reduced-Price Lunch

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

- CO2 Emissions p/household
- Sprawl
- Selected site
- Water Bodies
- Built Environment

Sprawl
- City
- 1920's
- 1930's (New Deal)
- 1950's
- NOW immigrants
- Rental backed securities
- Housing bubble
- 2nd gen suburbanites
- "Slum growth"
- "Urban renewal"
- Redlining + blockbusting
- "Urban renewal"
- Gentrification
- 1st great migration
- 2nd great migration
- GDP INDEX TARGET

Sprawl
- City
- Albany
- Hudson
- Kingston
- Newburgh
- Woodbury/Monroe
- New York City

Map showing the connections between sprawl, CO2 emissions, and natural potential 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

02 WHY DO WE PREFER CARS?

03 SPRAWL’S LAND USE
PROPOSED NETWORK

Proposed pathways and new connected nodes, take advantage of existing infrastructure to mitigate personal vehicle dependence.

New paths host different uses to increase transportation options.

Private-public partnerships are promoted to allow the paths to reach as many communities as possible.

STAKEHOLDER SECTION

PATHWAY DIAGRAM
BIG-BOX RETAIL IN THE HUDSON VALLEY

Legend
- Selected Site
- Waterbodies
- High Density Forest
- Medium Density Forest
- Low Density Forest
- Consumer Catchment
- Big Box Retail
- Highways

96
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
Ecological Strategies

1. Elevated Walkway
2. Terrace Edge
3. Detention Wetland
4. Retention Wetland
5. Rain Garden
6. Dry Creek

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Bioswale
Main Pedestrian Trails
Secondary Pedestrian Trails
Plantform | Bridge
Plaza
Dry Creek
Perennial Garden
Meadow
Wet Meadow
Rain Garden
Marsh
Shrubland
Hardwood Forest
New Wetland
New Retail Strategy

- Digital retail store
- Customization makerspace
- Plaza for pop-up retail stores
- On-demand warehouse
- Rooftop store
- Pedestrian walkway
- Shared vehicular street for warehouses

Community Forum
Botanical Garden
Transit Hub
Pickup Center in Downtown Newburgh
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
Finding the "Path of least resistance"

- Passive recreation opportunities
- Regenerative food distribution
- Training and networking
- Research Farms
- Public Institutions
- No Till Harvested Cropland
- Livestock Pastures
- Livestock
- Crops
- Sacthes in livestock feed
- Ease of animal transport
- Resource Sharing
- Farmer 1
- Farmer 2
- Farmer 3
- Farmer 4

Valatie and Kinderhook Case Studies

Institutional Opportunities

Connecting Farms

Rural Collaboration

Connecting Towns

Natural Systems
**FARM + INSTITUTIONS**

**VALATIE MAIN STREET**

**TRAINING CENTER**
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

Gate System
Pedestrian Path
Pasture lane
Alley crop lane
Crops
Livestock pasture

CREEK - WALK
CREEK - CROSSING

Opportunity to sell, exchange or share produce or resources
Low maintenance materials
Closer to urban areas the path can change its character to a more formal path

PICNIC MARKET: SHOP AND EAT
BIKE STATION: REST AND PUMP

Multipurpose shelters for farmers and shepherds
Seating areas and bike stations located along the path
Closer to urban areas the path can change its character to a more formal path
Low maintenance materials
Shared livestock path when required

CREEK - WALK
CREEK - CROSSING

1. Creek access
2. Pasture - lane
3. Cross at creek level
4. Shelterbelt - Silvopasture
5. Alle crop lane
6. Pasture lane
7. Pedestrian path
8. Creek acc
9. Resting/activity area
10. Shelterbelt - Silvopastures
11. Cross-country skiing opportunity
12. Pedestrian path
13. Creek access
14. Resting/activity area
15. Shared path
TRANSITIONING FARMER
INDUSTRIAL FARMER
NEW FARMER
ROAMING FARMER

1 YEAR
TODAY

EARLY AGROBUSINESS RETURNS
TRANSITION PLAN AND COMMENCE CHANGES
GROWTH AND RETURNS
PATH IMPLEMENTATION AND TOP DOWN FUNDING

ROI
MET
NITROGEN TAX PENALTIES

Profit up +30%

DIVERSIFY ASSETS
CONSTRUCTION AND TRAINING
MAINTENANCE JOBS AND NEW CIVILIAN CONSERVATION CORPS
INCREASE HERD/FLOCK
SILVOPASTURE AND ALLEY CROPS

INSTITUTIONAL BIDDING AND PARTNERSHIP
CARBON CAPTURE INCENTIVES

NITROGEN TAX PENALTIES

FARMER SHELTER: HOLDING AREA
Multipurpose shelters for farmers and shepherds
Shared livestock path when required

Seating areas and bike stations located along the path

REGULAR SECTION
PATH - CROSSING
WINTER RECREATION

CREEK - WALK
CREEK - CROSSING
REGULAR SECTION
PATH - CROSSING
WINTER RECREATION

PATH DESIGN

Seating areas and bike stations located along the path
Multipurpose shelters for farmers and shepherds
Shared livestock path when required
Carbon Sequestration

A tree, as a carbon machine, can store huge amounts of carbon in its body, estimated to 217kg per year. Reforestation, as one of the most cost-efficient nature based solutions toward climate change, can offset 30% of the carbon emission.

Currently in Hudson Valley, 74% of land is forested. However, there are still parts of forest are fragmented by urban development and human disturbance, which can decreases the amount of carbon sequestration, and negatively affecting biological diversity in the Hudson River Estuary corridor.

Our project is to reforest all the underutilized and inefficient land in Kingston, NY with the purpose of creating linked carbon sink. At same time, the aim is to supply local lumber and wood material to the community with green jobs.

Menghan Zhang, Tian Hao, Kuan-I Wu,

Sources: The Nature Conservancy (TNC) Eastern Conservation Science, New York Natural Heritage Program

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
THANK YOU

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