Contents

This is a design portfolio of selected works from academic projects as a student at the Columbia University GSAPP Urban Design program.
San Pedro is the mid-point between Corozal Bay and Belize City, with untapped potential for harvesting energy. As Belize’s leading destination for tourism and development, the proposal is an urban fabric through energy and infrastructure strategies paired with ecological restoration. Energy independence can be achieved in tandem with nature-based strategies towards decarbonization and coastal resilience. San Pedro can be the new model for climate resilience through clean energy and sustainable tourism infrastructure, and the blending of green energy through design can support regional ecosystems.

The current San Pedro landscape can be reimagined as permeable public spaces, retrofitting buildings, and waterfront strategies of protection from storm scenarios, and expansion of the public beach. A new postcard image for San Pedro is proposed by rethinking urban design with energy centrally integrated into our built environment and allow for such infrastructure to become a eco-tourist destination. With energy and infrastructure forefronted in this new image, the unit of change can be an example for Belize and the Caribbean.

Em(power)ing Belize
Urban Design Studio | Urban Environments, Belize & Yucatan | Spring Semester 2022

In collaboration with Lucas Castillo Reyes, Guilia Chagas, Thais Paesani, & Lorena Bello Gomez
San Pedro, Belize
San Pedro and Belize are heavily dependent currently on imported energy from Mexico and the tourism industry. Design matrix solutions combining energy, infrastructure, and ecological restoration through different time periods. Existing site plan and conditions for interventions. Site plan with key strategies for the lagoon, town core, and beach front.
Solar modules siting map in the lagoon.

Solar infrastructure, mangrove restoration, and ecotourism.

Phase 1 solar module rollout.

Phase 2 expansion of modules and commercial fishing industry.

Wind turbine modules siting map for coral restoration.

Future bladeless wind turbines, carbon captures, and scuba visitors center.

Phase 1 wind turbine module rollout.

Phase 2 module expansion and coral restoration.
Enhanced beach front and shaded area for the tourists.

Beach pavilion for cultural activities and visible energy infrastructure.

Increased public space locations.
Ground floor retreat, new research centers, and areas for small businesses and community engagement.

Central bioswales and structural soil for rainstorm filtration.

Stormwater mitigation to floodable spaces and controlled locations.

360 VR bay render for solar energy and aquaculture.

360 VR town core render for urban retrofits and street redesign.

360 VR reef render for wind energy and coral restoration.
The proposal seeks to challenge the understanding of value, to prioritize human intangible forms of wealth building over financial gain. By targeting vacant lots in the English Avenue neighborhood of Atlanta, we redefine vacancy as spaces that require care because they have historically been neglected and devalued, and transform them into spaces that generate a new type of wealth centered on collective and communal growth.

The framework utilizes renewable energy production as an effective means to generate wealth that can be redistributed back to the neighborhood.

At the neighborhood scale, the modifications of the community anchors strengthen the intangible social networks, creating a continual system of development as the community needs change over time. As vacancy is not an issue exclusive to English Avenue, the model can become the inflection point in an expanding constellation of vacancy redefinitions in other neighborhoods in the Atlanta region at large.
Existing and final phases of the community anchor renovations, including the energy production model. In collaboration with Minsung Kim.

Countering vacancy with refurbished spaces of care and communal growth. Sections by Haotian Jiang.

Communal growth at the street block scale.
Before property, counter property, and after property. Renderings by Haotian Jiang.

Maps of community networks, with formal community spaces, informal community spaces, and site selection intervention zones. Graph by Stijn van Houtum.

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At the neighborhood scale, community anchor renovations create a rhizomatic network of connections in collaboration with Minsung Kim. English Avenue becomes the model for the rest of Atlanta to counter vacancy and establish networks.
Reclaim the Air

Urban Design Studio I: The New York Studio | Summer Semester 2021
Professors Nans Voron, Sagi Golan, Jae Shin, Galen Pardee, Austin Sakong, Sean Gallagher, & Tami Banh
In collaboration with Carmen Yu, Minsung Kim, & Javier Ortiz
Newark, NJ

Focusing on research and data visualization into air quality and levels of pollution in Newark, the proposal seeks to combat pollution, restore air quality, and explore ways to accelerate improvements in community health through design. Air pollution caused by toxic factories, transportation, and foul odors leads to increased health concerns and affects vulnerable communities. The design proposal commits to designing a healthier environment and to promote a healthy Newark region.

Since air pollution does not follow boundaries, each type of pollutant requires a different intervention at the point one interacts with the environment. Design solutions based on capturing technology can also protect and educate the community.

The project framework consists of a test site of the design intervention matrix followed by an expansion into separate sites around Newark for the different conditions of the city and surrounding river areas. Finally, the program has the ability to be adopted at a state level and to view New Jersey as the model for improving air quality and combating pollution.

Full presentation and animations link: https://www.youtube.com/watch?v=zAfrvC1v7Gw

Animation of vehicle air pollutants across seasons. In collaboration with Minsung Kim

Hackensack River and Passaic River existing conditions
Map overlay of pollution dispersion across the northeast and additional regional sites to apply design the matrix.

Major pollution dispersion across the northeast affecting Newark, and flights through Newark and New York City which contribute to pollution levels in the region.
Maps of facilities and chemicals emissions across Newark which informed site selection. In collaboration with Minsung Kim.

Asthma rates of people of 18 in the New York/Newark region. In collaboration with Minsung Kim and Carmen Yu.

Site selection based on pollution dispersement to different urban conditions.
Design matrix elements applied at the three sites.

Sections in collaboration with Minsung Kim.

Sections and callouts at the wetlands, residential areas, and river front conditions. Sections in collaboration with Carmen Yu, Javier Ortiz, and Minsung Kim.
The existing Chicago grid has resulted in an uneven distribution of density across the city. Our proposal aims to increase density and place from nodal development, with a clear pattern of commercial spaces, residential areas, and open spaces adaptable to existing site conditions.

The current city grid consists of an orthogonal layout with intermittent avenues diagonally intersecting the rigid grid fabric. The new grid aims to increase the amount of streets by diagonal and rearrange them in a radial order around a series of nodes. The center of the nodes are the commercial spaces and office buildings; then as the plan radiates out the density changes to residential apartment buildings.

As a series of quadrants, the new fabric responds to existing site density and context. As the forms move from east to west, the building height decreases to provide a smoother density between the lakeside and the residential neighborhoods to the east. Similarly, from north to south the building heights decrease away from downtown. As the train line intersects the site, parking garages are built around the rail line.

Existing conditions of the site and similar Chicago neighborhoods to South Loop.
Perspectives and axonometric of proposed fabric scheme.

Axonometric of typical apartment building floor plans.
Individual and team collages of urban biographies.

Public Space/Recombinant Urbanism

City analysis of Mexico City over time through the four city models of arche citta, cine citta, tele citta, and meta citta. From its Aztec origins to the contemporary city, enclaves, armatures, and heterotopias emerge through layered spaces with elements in each model. As the historic city progresses, the elements of each model branch off from the center and leave memory traces along the way across the city.

Analysis of the city is explored through formal drawings, research of existing systems, and collages of urban elements.
Timeline of the four city models and layout of public spaces.

Enclaves, armatures, and heterotopias through the four city models.
Digital techniques were explored as part of the course in tandem with studio projects. Digital lessons and explorations of representational skills included GIS, 3D modeling, rendering and animation and video editing. Final assignment included constructing a video manifesto of the studio design proposal.

Sample animation videos of sectional perspectives for final review:
Passaic Riverfront 1: [https://www.youtube.com/watch?v=iubGur8LOa0](https://www.youtube.com/watch?v=iubGur8LOa0)
Passaic Riverfront 2: [https://www.youtube.com/watch?v=zhOv0DnZue8](https://www.youtube.com/watch?v=zhOv0DnZue8)
Reading New York Urbanisms (RNYU)

Professor Cassim Shepard

Reading New York Urbanisms (RNYU)

https://storymaps.arcgis.com/stories/7020c798cca84853b1783c1d077b421b

The neighborhood of Bedford-Stuyvesant, Brooklyn has undergone a series of changes over the course of the past century and a half, as the residential, commercial, institutional, religious, and community spaces within the neighborhood evolved in response to the changing needs and aspirations of the residents that make up the neighborhood. This study examines the neighborhood from the perspective of residents as they use both the available public space and open areas within the mixed-use neighborhood set up, with a wide range of residential, commercial, institutional, religious, and community spaces and exterior structural components. Angled buttresses and dematerialized walls with stained glass feature in the cathedral hints at the mathematical sublime and a working relationship between the grand interior architecture and the audience, and context.

Elective Appendix

Professor Noah Chasin & Instructor Charlette Caldwell

Final assignment analyzed the Lower Manhattan Expressway proposal (1967-1972) by Paul Rudolph and its implications for the future of New York City infrastructure. The project failed in that it was designed for the automobile and not the human. Formal gestures to provide for more livable neighborhoods disconnected the existing street network and context. While new approaches now see the oil problem of configuring highways systems into cities without disrupting current communities, the proposals in RNYU continue to focus on highways and the existing fabric.

Elective | Spring Semester 2022

Structural Daring & The Sublime

Professor Mark Wigley & Instructor Ultan Byrne

Analysis of a piece of theory with a focus on the ideas and strategies, subversion of context and claims of anti-contextualism, and inclusion of programmed and non-programmed spaces within the park. The project operates in a boundless condition, that is, the differences and contradictions that a plurality of meanings and therefore a veritable deconstruction for these very contradictions.

The History of Architectural Theory

Professor John Huth

Phenomenological investigation of the Cathedrale Saint-Gatien in Tours, France and the sublime effects of its angular forms. Phenomenological investigation of the Cathedrale Saint-Gatien in Tours, France and the sublime effects of its angular forms.

Elective | Fall Semester 2021

Theoretical Turn in Architecture

Professor Cassim Shepard

Critique of contradictions in Bernard Tschumi’s Palais de la Découverte and analysis of the project’s influence on Deconstructive Architecture in the 1980s. Critique of contradictions in Bernard Tschumi’s Palais de la Découverte and analysis of the project’s influence on Deconstructive Architecture in the 1980s.

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