

Beyond Industry: A Systems-Based Approach to Collective Form

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Globalization and capitalism are resulting in the emergence of more and more urbanized landscapes. As the world becomes increasingly globalized, ports become ideal places for investment and development. Because of its strategic coastal location, Prince Rupert—a small town of 13,000 residents in Northern British Columbia, Canada—has one of the fastest growing port terminals in North America and is the epicentre for the exploitation of natural resources in Canada. As Prince Rupert evolves, peak oil is reached, and non-renewable resources decline, we can imagine a transition toward a renewable resource economy, an increase in renewable resource industries, and an influx of diverse groups of people.

Canada is a resource rich landscape with an economy that relies on the exploitation and export of lumber, pulp and paper, grain, coal, oil, and gas. There's a clear contradiction between our values of environmental stewardship and the importance of resource extraction for the prosperity of the Canadian economy. As a result of industries coming and going,

many Port towns have a history of boom-bust cycles. With an expanding global economy, we could see a massive boom and an influx of both new industries and, as a result, new residents in these coastal communities. There is potential for population increases of hundreds of thousands of people, shifting these place's identities from inward facing local communities to outward facing global economies. This project asks, how can we explore novel ways to integrate resource industries and processes into our urban environments? How can we create a framework for industrial infrastructure to be productively weaved into the urban fabric of a growing city?

Fumihiko Maki's 1964 *Investigations in Collective Form* is adapted to act as the guiding framework for this project. Maki's writing suggests, "Our concern here is not, then, a 'master plan,' but a 'master program,' since the latter term includes a time dimension. As a physical correlate of the master program, there are 'master forms' which differ from buildings in that they, too, respond to the dictates of time.

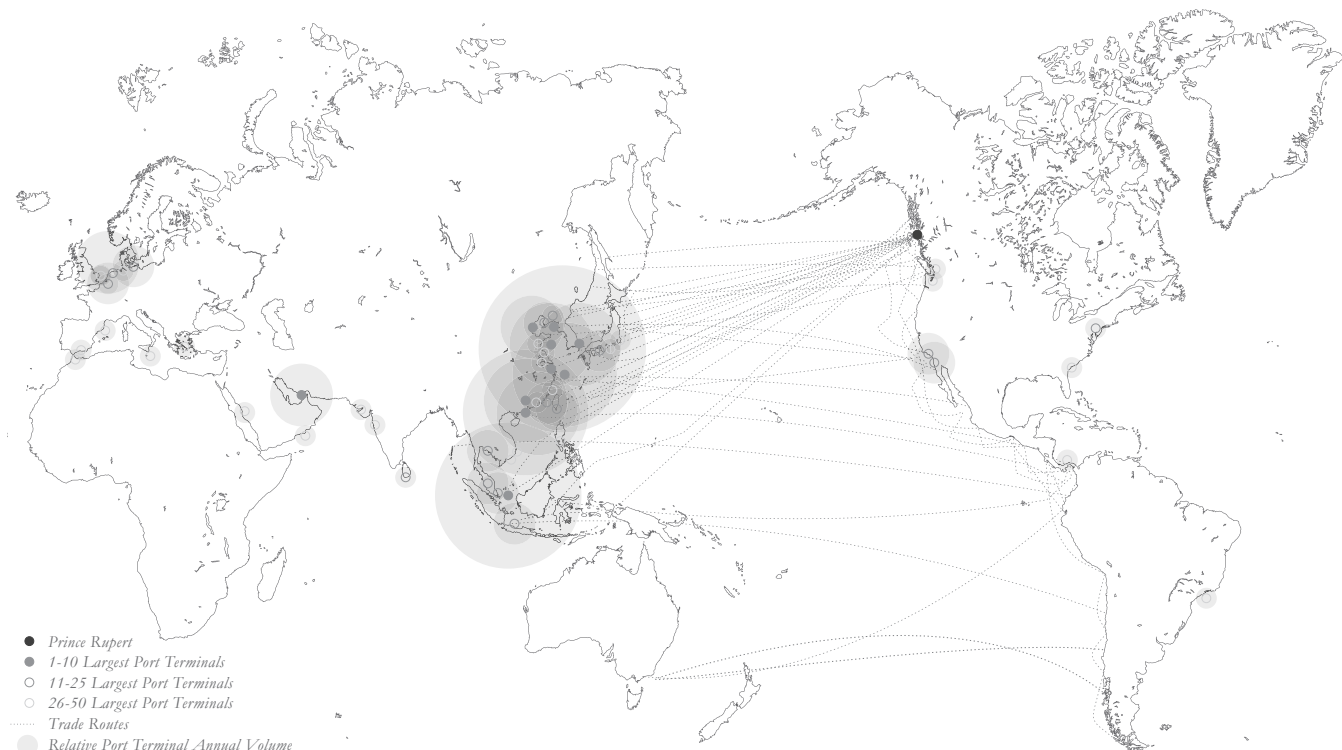


Figure 1. Map of 2018 Annual Global Trade Volume with Projected Networks. Jesse Martyn.

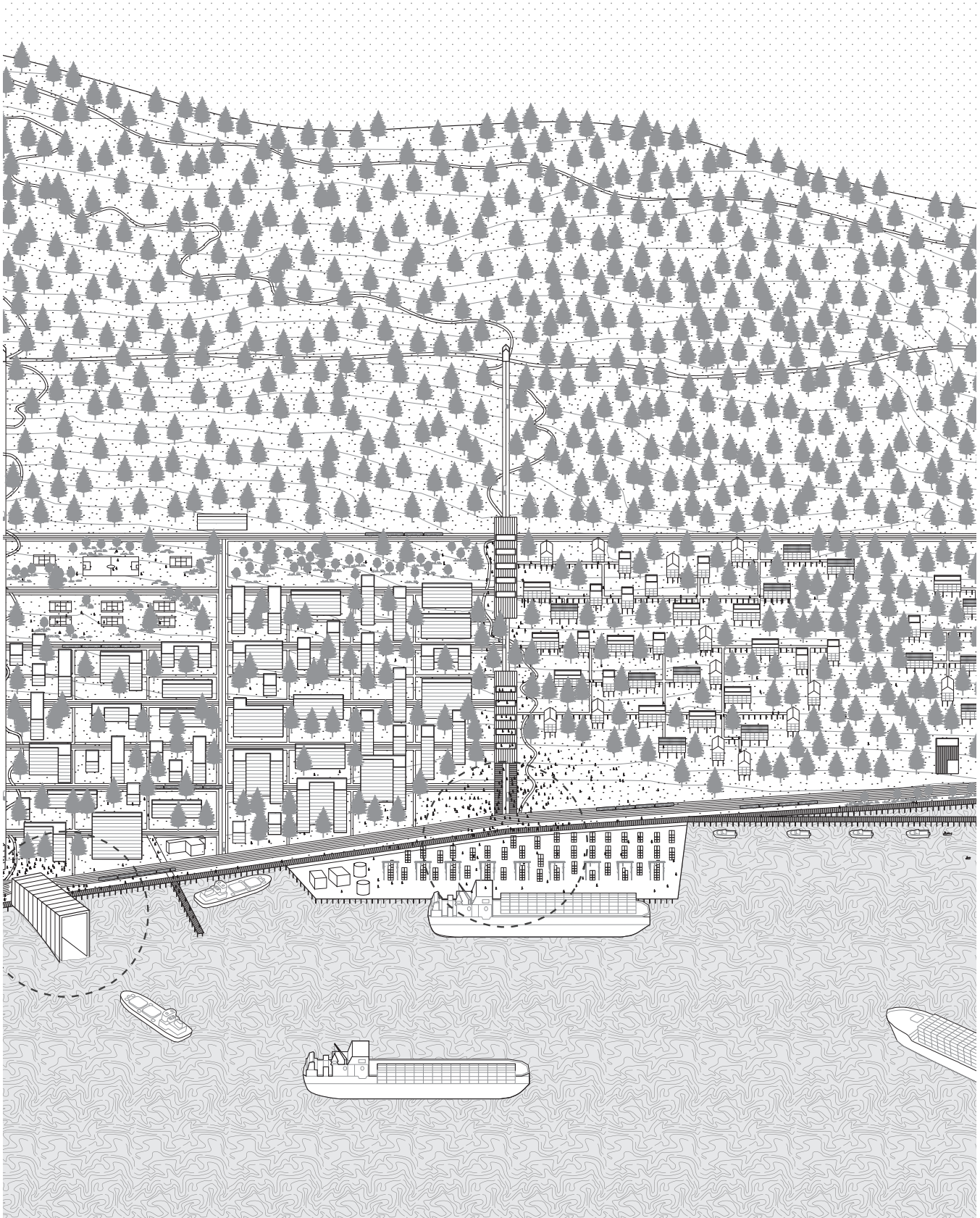


Figure 2. Prince Rupert Industrial Districts, Megaforms, Group Forms, and Compositional Forms. Jesse Martyn.

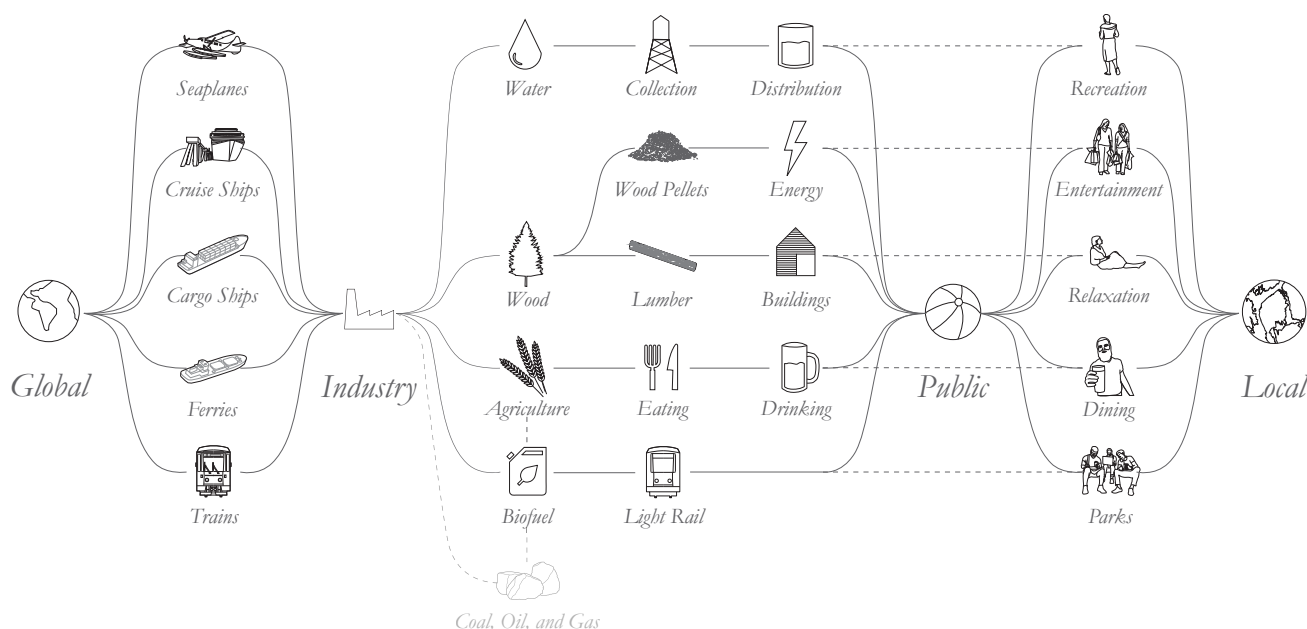


Figure 3. Resource Connectivity Matrix. Jesse Martyn.

Collective form represents groups of buildings and quasi-buildings—the segment of our cities. Collective form is, however, not a collection of unrelated, separate buildings, but of buildings that have reasons to be together.²¹ Maki's three major approaches to collective form—compositional form, mega form, and group form—are used as the fundamental base layer for this project. Compositional forms are elements that are preconceived and predetermined separately, with functional, visual, and spatial relationships.² This proposal applies compositional forms as urban superblock infills. Mega forms are large frames housing all the functions of a city.³ Mega forms will be applied as Industrial spines. Group forms are forms which evolve from a system of generative elements in space.⁴ Group forms will be deployed as rural clustered communities. Each of these forms have their own built-in link, whether expressed or latent, so they may grow in a system.⁵

With the adoption of Maki's theories in Prince Rupert, the industrial processes taking place along the coastline can become the drivers of new industrial spines, birthing megaforms that ripple through the city, connecting the ocean to the mountain, industry to nature, and resources to public space. These megaforms can exist physically by way of continuous bridge structures or by implied processes that take place along a path. Compositional forms, as larger scale urban infills, and group forms, as informal community developments, are supported by and clustered within the spaces in-between megaforms. Resources expand from the local to the global and become generators for both the economy and the public realm. By using resources to bridge the gap between industry and the public we start to foster unique human experiences that integrate the resource economy with urban life. Processes are not only on display but are valuable contributors to everyday

experiences and recreational activities. Local agriculture and bioremediation facilities generate food production and transit fuel, coupled with a biomass theatre. Water is collected and distributed to supply people and support agriculture, while introducing recreational bath houses. Locally harvested trees are processed to construct buildings, including housing and recreational saunas, with the resulting wood pellets used for a biomass district heating system. Resources from out-of-town pass through as exports or as surplus local supplies that help build the community physically and economically. This results in the defining of resource-based districts.

Resource-based districts are developed through a program that consists of coupling industry with infrastructure and architecture, anchoring nodes with tethered development, and hybridizing sites using a multivalent design approach. The industrial landscape seizes the potential of old machinery. A former coal mill and propane export facility is now a bioremediation lab and research centre. Research and development is used to convert this carbon export facility into a productive landscape that supports adjacent communities. Connecting to rail lines, a waterfront wood processing facility receives logs from out of town and processes the wood for exporting. It uses selective locally harvested trees for constructing group form buildings in their place. A hillside wood boardwalk community is developed up the mountain connecting to recreation trails and leisure along the waterfront. Lumber is manufactured to promote the development of innovative wood building materials while housing workers in the neighbourhood. Through the integration of resource processes into everyday life, people begin to interact more seamlessly with industry, architecture, and the landscape.

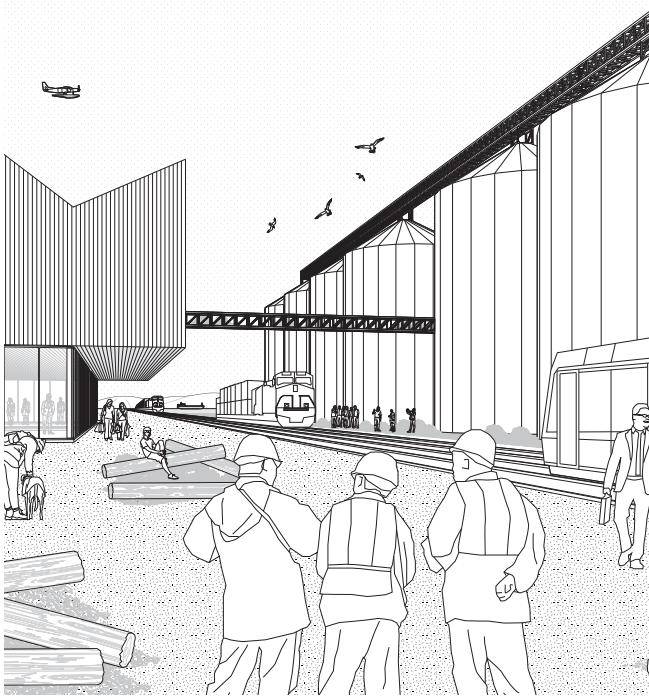


Figure 4. Waterfront, 'The Exchange' Perspective. Jesse Martyn.



Figure 5. Nature—Industry Mountain Perspective. Jesse Martyn.

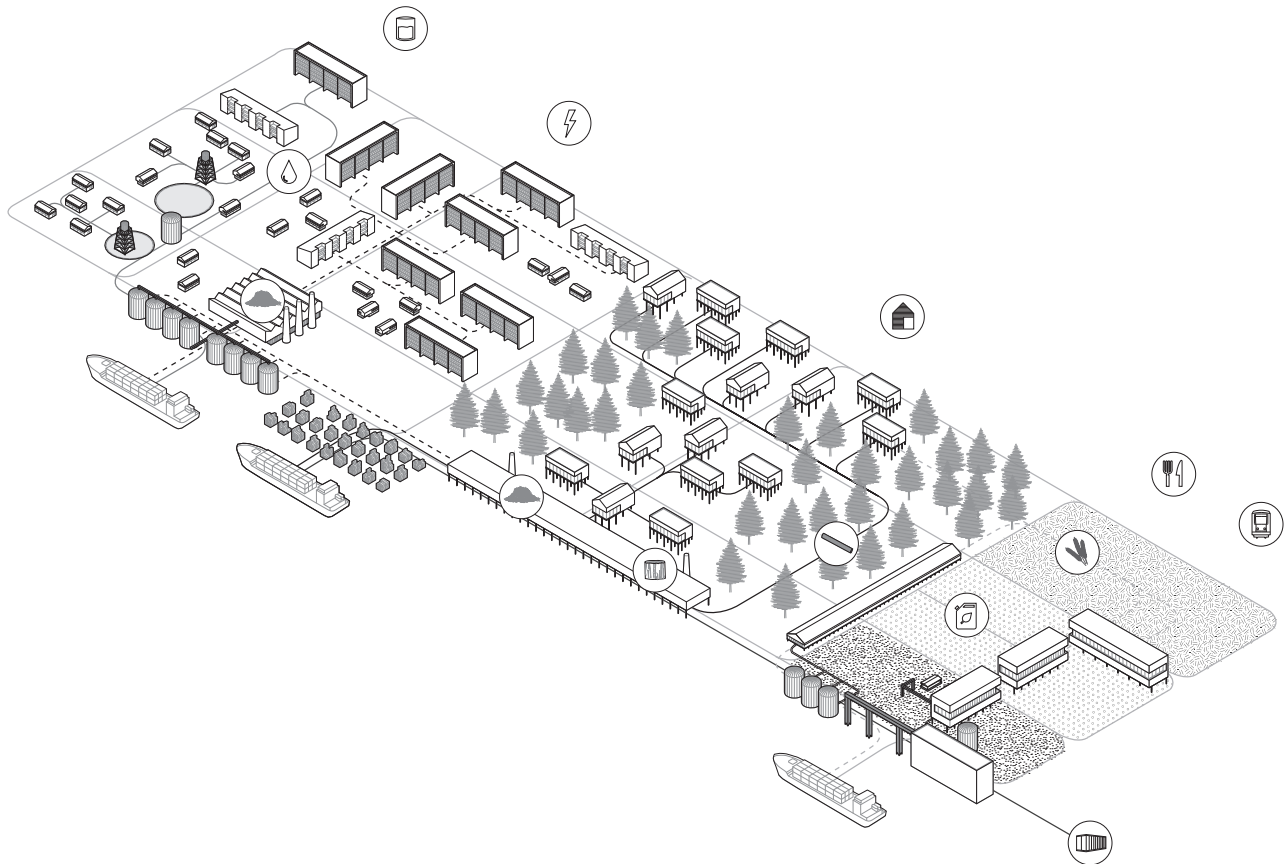


Figure 6. Resource Flows Diagram. Jesse Martyn.

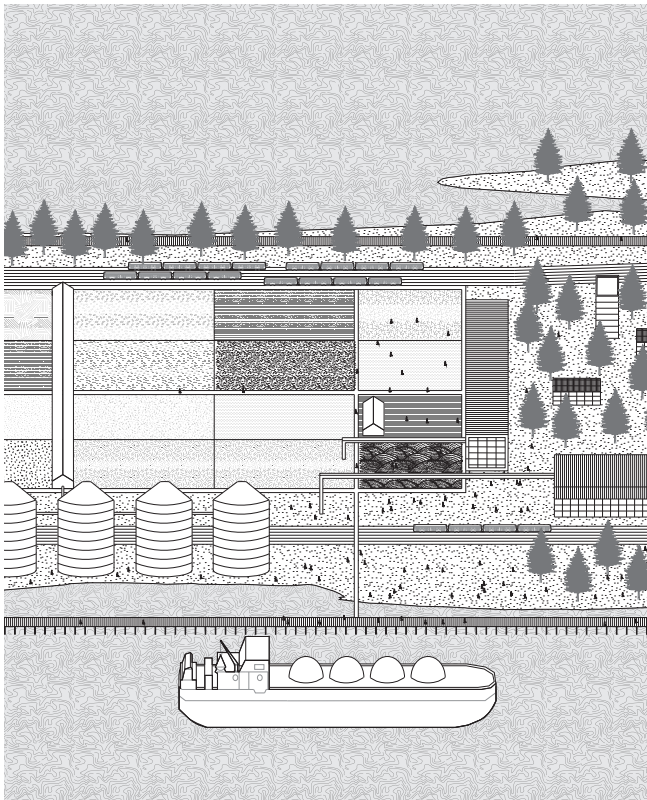


Figure 7. Ridleyville Bioremediation. Jesse Martyn.

This urbanism seeks to blend the city with the environment, and the processes taking place. Urban life integrates mixed-use typologies at a variety of scales. It prioritizes green space, creating micro-communities that tether to the industrial spines that are adjacent. The waterfront is a mixture of leisure and port activity with diverse groups of people and resources all converging at these points. Decommissioned industrial zones are adapted to make way for renewable resource economies, productive landscapes, and public occupation. Local resources are at the forefront of the urban fabric, are integrated into everyday life, and at the core of leisure activities. This creates an urbanism where industry, resources, the economy, and the environment are all synergized into one collective form.

Our relationship with natural resources, industry, the economy, and the environment are complex and constantly in a state of contradiction. This relationship is explored through an understanding of the city as a collective form. Positioning industry as a generator, a systems-based approach to collective form imagines an urbanism through the lens of a form, a strategy, and a program. This project forecasts the future generative potential of industries stimulating the Canadian resource economy, while allowing these industries to productively shape the built environment and the exchanges that occur within it. "Urban society is a dynamic field of interrelated forces,"⁶ and as such, this project positions the architect as a mediator. It proposes approaches not as fixed

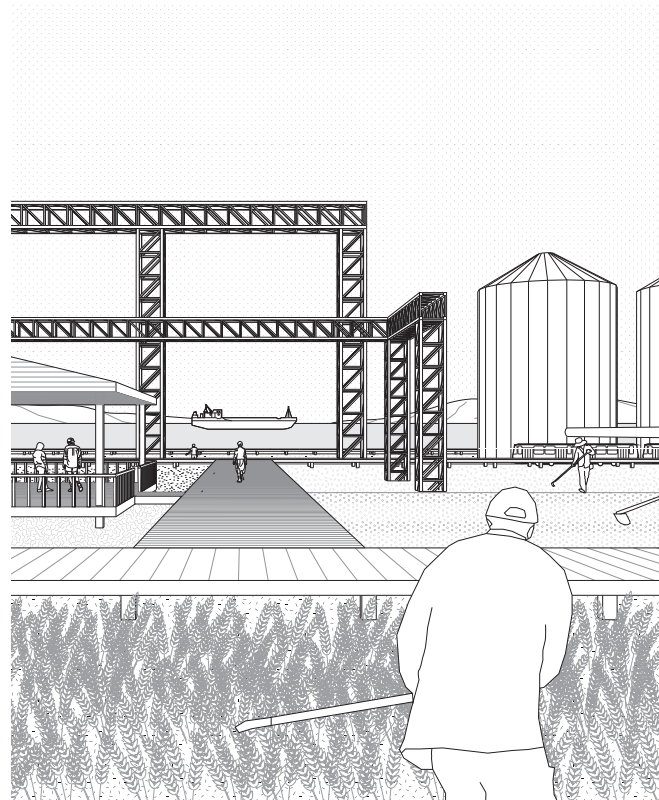


Figure 8. Ridleyville Agricultural Production. Jesse Martyn.

solutions, but as possibilities for how a place can evolve in response to shifting geo-political and socio-economic values. It explores an urbanism that can develop and adapt to support these shifts, highlighting the need for the designer to consider cycles and transformations. Post-war carbon economies can transition toward renewable resource economies as a catalyst for diversification and growth of the collective city.

A systems-based approach to collective form gives way to industry's role in the development of the city. This framework investigates the architect's ability to design systems and strategies as tools that can extend from the human scale to the territory. It considers collective form not simply as a physical manifestation, but as a collection of approaches that engage with multiple vehicles and actors, resulting in a whole that's greater than the sum of its parts. As Maki suggests, "the human quality which determines form has to do with the way of life, movement, and relation of persons in society."⁷

ENDNOTES

1. Fumihiko Maki, *Investigations in Collective Form*, (Washington: School of Architecture, Washington University, 1964), 4-5.
2. Maki, 6.
3. Maki, 8.
4. Maki, 14.
5. Maki, 19.
6. Maki, 21.
7. Maki, 3.

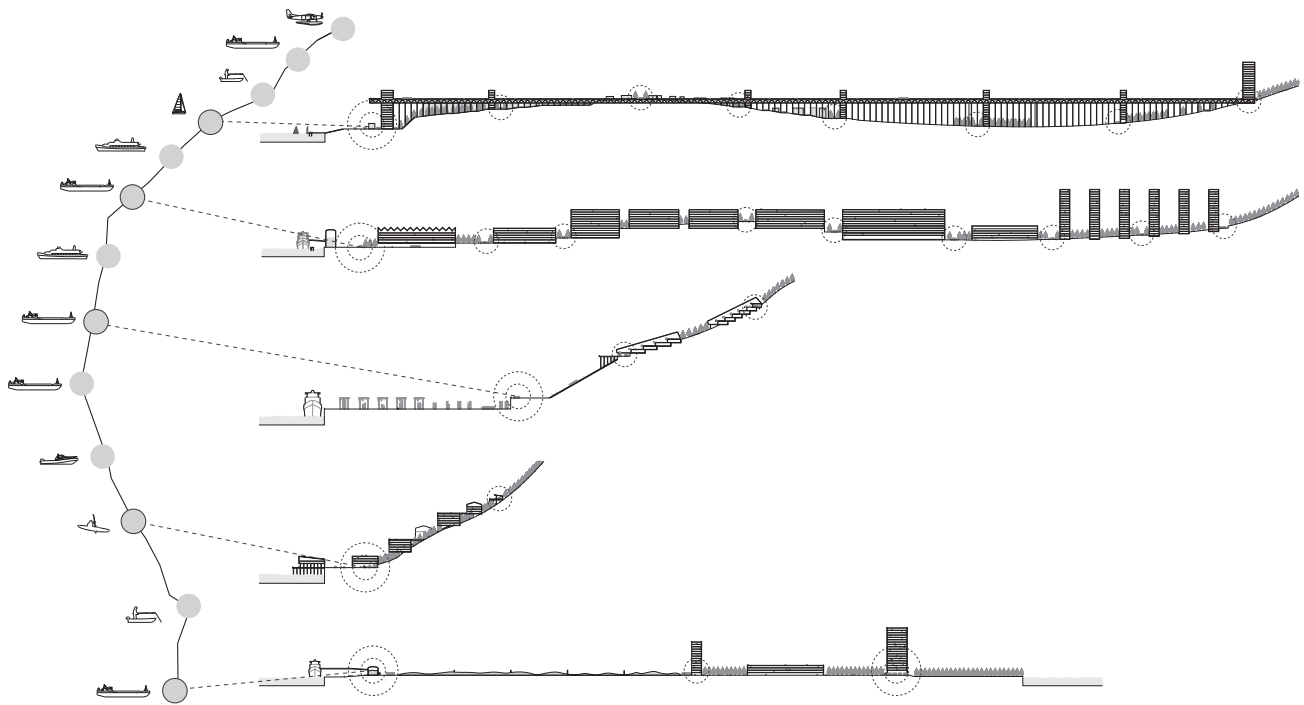


Figure 9. New Industry Nodes with Megaform Spines. Jesse Martyn.

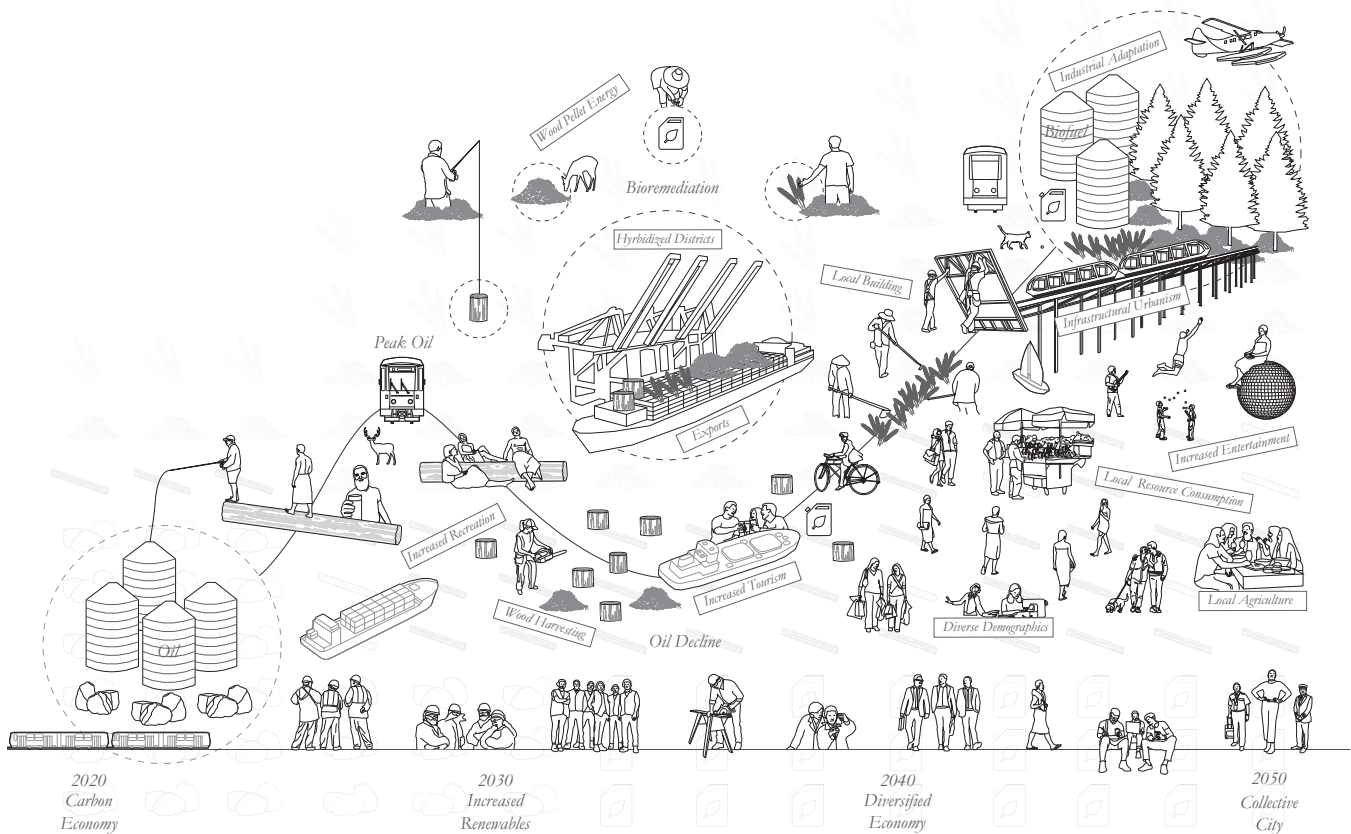


Figure 10. Chronology. Jesse Martyn.