Transplantable Urban Design for Polynuclear Cities

This paper tracks the master planning and design considerations of seven architectural offices for an expanded city center in Accra, Ghana and the subsequent transplantation of the design to Cape Coast, Ghana. The proposal includes the design of a new district with external agency and internal autonomy that anticipates its own transplantation from one city to another as multiple cities vie for the project.

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EXPANDED MASTER PLANNING

We abandoned the abstract hegemony of top-down, figure-ground master planning in favor of a more fluid, three-dimensional design environment that utilizes difference as a catalyst for change.

To better patch a new urban plan into an existing cities fabric, the design includes an outward reaching framework while supporting autonomous and discrete building projects. This method rejects concepts of typology and vernacular in favor of variability and asymmetry. A city that is overly prescriptive lacks the diversity that fosters emerging development and the foundation to generate unique, city-specific urban space. As Thom Mayne notes, "most urban architecture today—in particular, new urbanism—dangerously accepts Cartesian planning as the default means—as the only means—of demarcating land and organizing citizens."[1] The use of a top-down Cartesian grid to plan a city flattens a project's potential design space and severely limits one's capacity to intervene in what really matters, the three-dimensional realm of the world.

Rather than reduce urban complexity to a simple ordering schema, we argue that planners seeking to revive a city center should engage the full spectrum of extant social dynamics that surround a site and use these elements as catalysts for change. Conventional master planning techniques limit the effectiveness of design by not acknowledging the temporal and immaterial realities of city life. A multi-dimensional design approach increases our potential field of intervention, allowing for better specificity of building projects that are more closely related to their context. Though autonomously designed, such projects remain contingent in their ability to engage conditions unique to each site and to respond to the real-time environmental feedback produced by adjacent buildings in the design.

Connectivity between building and context binds the master plan, while variation encourages the emergence of new urban forms that truly activate a city. As Manuel Delanda notes, "explosive, self-stimulating 'autocatalytic' urban dynamics cannot emerge when hierarchical components overwhelm meshwork components."[2] The successful design of a discrete urban

package as a system of collected entities within a variable framework has the advantage of embedded potentiality, while the organizational freedom of the master plan allows the design to be reused at other sites with only minimal reconfiguration of the network.

EVOLVING CITY INFRASTRUCTURES

Hierarchical city plans presuppose a tabula rasa—a blank slate on which a plan can be scribed from above. Even worse are master plans that propose the fusion of an ever-evolving city with a highly regimented order that has little to do with existing infrastructural networks. These generic plans typically result in gridded streets packed with highly repetitive buildings with only minimal formal or programmatic variation. Such prescriptive cities within cities lack the kind of differences that naturally evolve over time and are so alien as to completely undermine the potential advantages of implementing a new master plan in the first place.

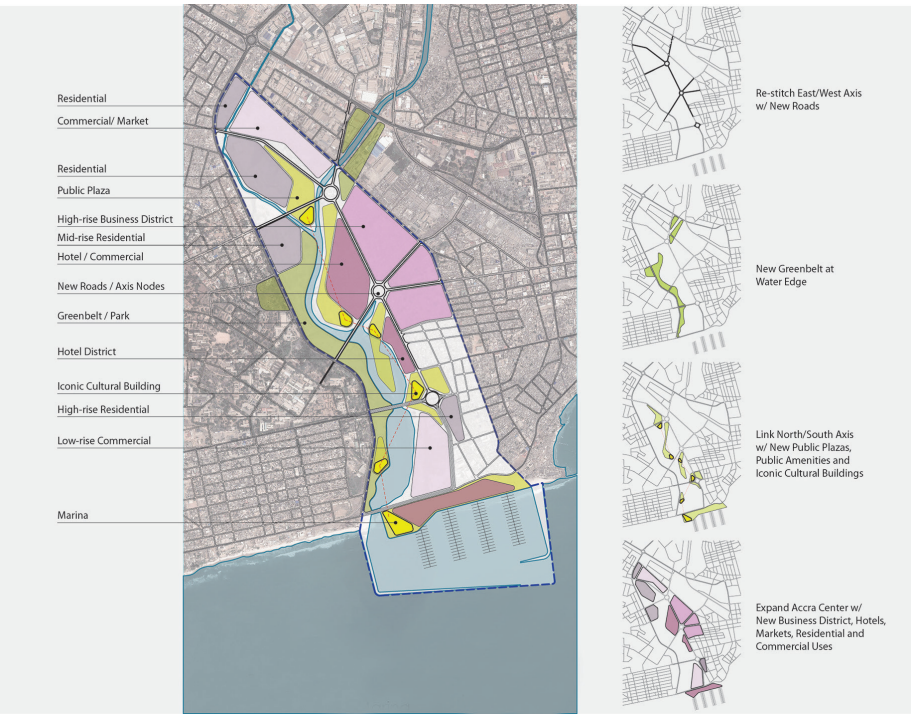

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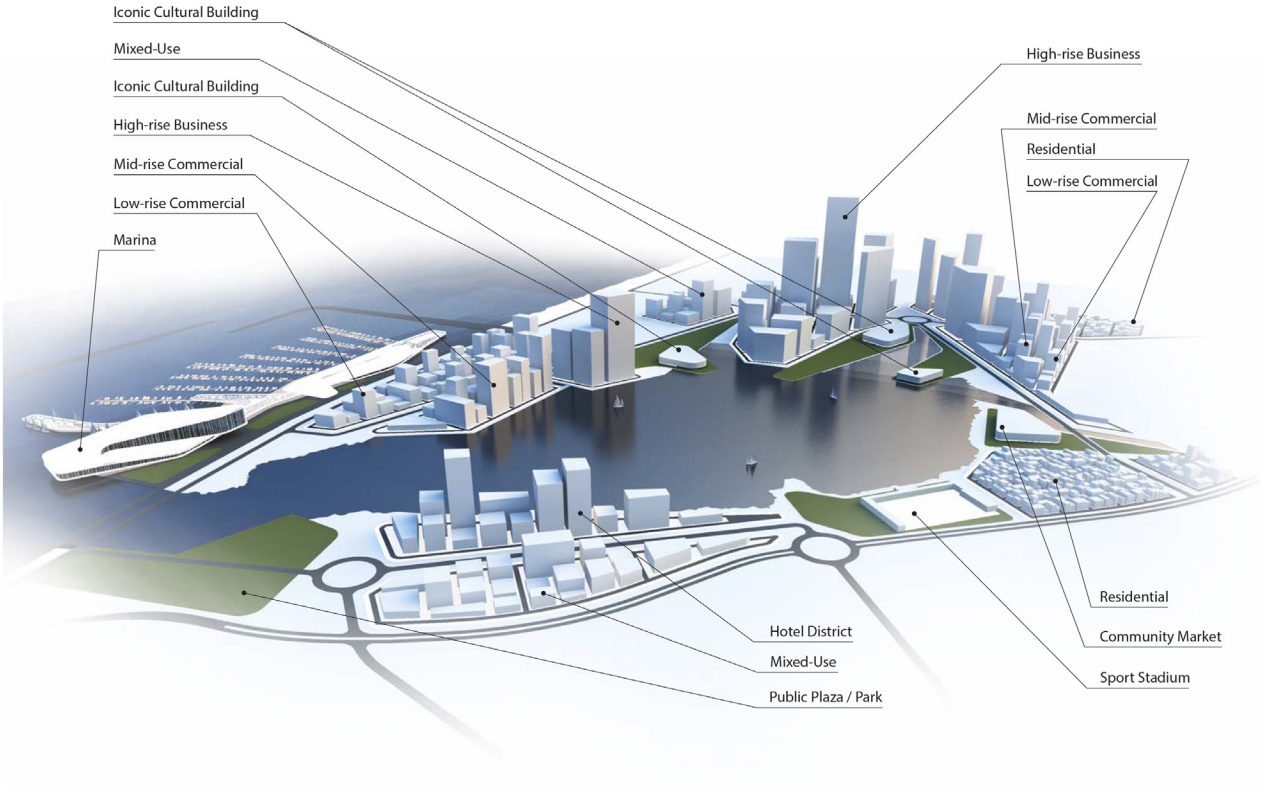
Figure 1: Initial Master Plan for Accra, Ghana.

For this master plan, we were asked to develop an existing site adjacent to a dense urban area that was in need of remediation. During the design phase, multiple sites in both Accra and the city of Cape Coast were being considered. The design had to be readily deployable in multiple locations due to a condensed schedule. The conditions present at each site differed topographically, in population density, and existing traffic patterns, so our primary objective was to connect to existing infrastructural networks by redirecting adjacent flows through our site. Buildings were designed simultaneously and in some cases prior to the master planning phase, so their autonomy was not only of ideological interest, but also a necessity of the process.

Of course, cities are complex and infrastructure consists of more than sewage, electricity, water, and roads. Eco-systems that include air flow, vegetation, and daylighting, as well as material selection, scale, economy and cultural tendencies should also be part of the early planning phase. To truly capture all infrastructural layers, a shift from Cartesian and figure ground planning to a more three dimensional strategy is required. Information that appears to overlap in plan, is revealed in totality once the space is represented three-dimensionally. As Fumihiko Maki notes, “we are successful at making unified and meaningful complexes



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of form and activity near the ground, (but) we are notably unsuccessful at going into the air with linked functions."[3] As buildings go up, we must, as designers, consider the space between them as closely as we consider the ground plane.

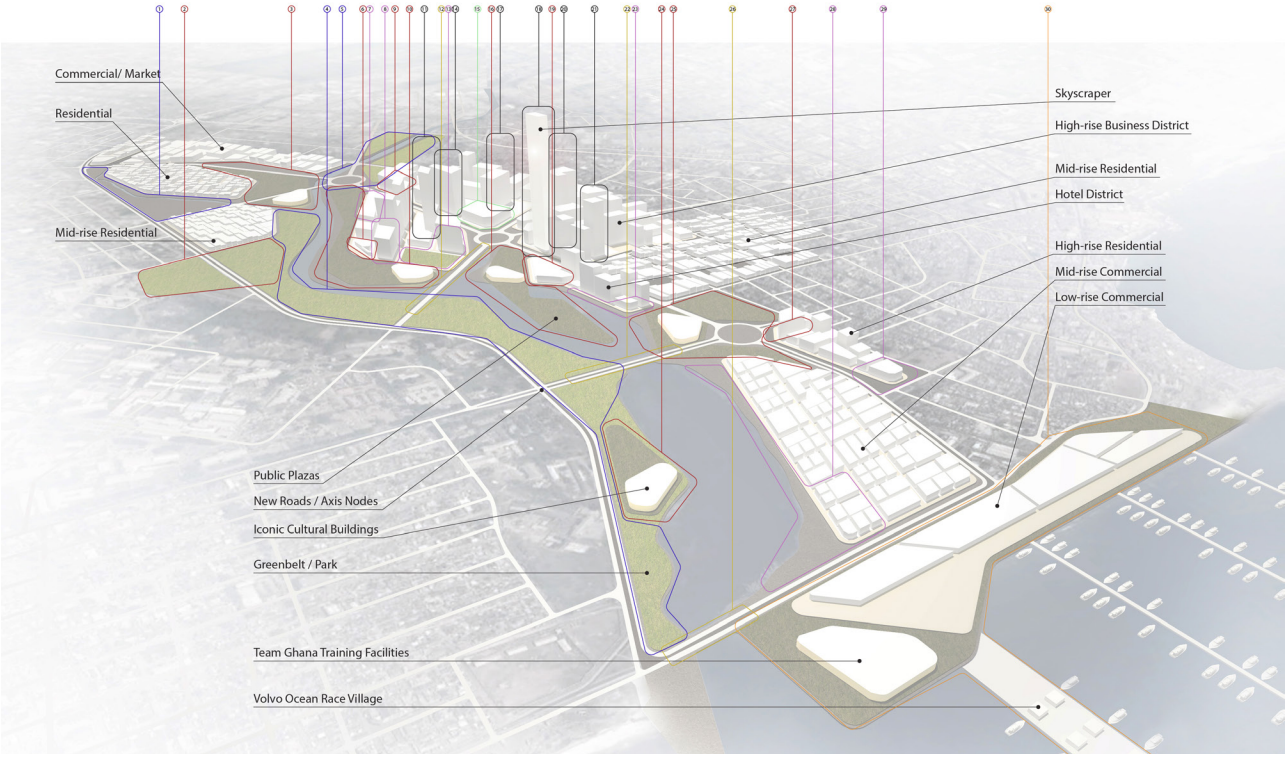
This same principle applies to every facet of the urban network. A discrete, autonomous building project is contingent on more than the traffic pattern at the ground level. The entire environment influences the design and additional considerations of building performance and the project's physical presence in the city must be evaluated. By acknowledging local specificity over global generality, we reject the reduction imposed by top-down planning and can better resolve the integration of a new master plan within existing flows at an urban site.

GROUP FORM

In the 1960's, the Metabolists coined the term "group form" to describe an approach to master planning that supported the systematic curation of independent buildings into a cohesive group. The Metabolists believed that a city "composed of several independent systems that can expand or contract with the least disturbance to others would be more preferable to a rigid hierarchical system."[4] Each building within the group would operate independently of the others, both in form and function, but not so independently as to not contribute to the collection as a whole. Maki and others believed that a new urban development should be designed to change over time. To cling to an old hierarchical master plan would only destabilize an otherwise evolving city. By fostering changing and emergent urban forms, Metabolists believed that a city could adapt and grow with the introduction of new technologies and cultural transformation. By eliminating hierarchical structure, a city could distribute its resources more evenly and resist urban decay.

Modern cities are polynuclear and multiplicitous and can be understood as hyperobjects;[5] objects that are more than the sum of their parts and exist as a mesh with all its interconnectivity and gaps. It is within these gaps that master planning synthesizes an affable

Figure 2: Expanded Master Plan for Cape Coast, Ghana.



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cohabitation between autonomous building projects and an existing context. At the same time, autonomous building projects should be designed parametrically—which is to say that, although a building is designed autonomously, it should remain formally elastic until the master plan of which it is a part is connected to the infrastructural context of the site. A building's final form should express properties that best match the adjacent conditions of its final position in the plan. In some configurations properties might be suppressed, while in others, otherwise suppressed properties might be expressed. For this to occur, buildings should be designed with as much qualitative capacity as possible. As Maki notes, "forms in group-form have their own built-in link, whether expressed or latent, so that they may grow in a system. They define basic environmental space which also partakes of the quality of systematic linkage."[6] The latency between buildings includes complementary attributes that can be emphasized in both buildings and the literal space between them.

Though not exactly a Metabolist project, our design for Ghana shares some of the same principles. In the Ghana Plan, we valued heterogeneity over homogeneity and created a collection of buildings with different programs and typologies in order to foster productive material and experiential interplay within the district. We avoided repetition by designing buildings independently and concurrently. The design team had only two coordination meetings throughout the design process. The first was to allocate the building projects to each firm, and the second was post-design. Each contributor was then allowed to marginally reframe their project in relation to the whole. The intent was not to redesign each project, but to adjust those parameters that would best complement adjacent buildings.

The design team was selected based on the range of interests and specialization of each firm. Only teams concerned with contemporary speculative architectural pedagogy were selected. The goal was to create an overall urban intervention that would promote dynamic urban patterns to emerge from the difference of each building juxtaposed with its neighbor. The differentiation between buildings is mirrored in the diversity of the community for which the buildings serve. Qualities that are not expressed remain unique to the building,

Figure 3: Site Selection Map for Design Teams, Accra Master Plan.

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yet contribute to the overall diversity of the city locally. In his description of personal autonomy and the elaboration of social organs, Georg Simmel notes:

> "The more an individual is separated from community, the more the individual is emancipated from the interactions and coalescences that it replaces, and the more he is left to his centripetal concerns and tendencies. The generation of functional organs is the means whereby the cohesion of the group is united with the greatest freedom of individuals…thus, the differentiation of social organs does not mean that individuals are detached from their connections with the whole, but rather means that they devote only the substantively relevant parts of their personalities to those bonds. The point at which the individual momentarily touches the totality or the structure of the whole no longer pulls parts of his personality into the relationship that do not belong there."[7]

The complete independence of a building as an autonomous entity severs direct parametric links between adjacent buildings, promoting generative emergent urban spaces that result from that difference, rather than the sort of erasure that would result from repetition. The nature of the gap between buildings should not be constrained by the surrounding building's design. It should take on its own unique character as a product of local differentiation.

Though qualities might be shared and some bond established between them, buildings remain independent and their differences produce a sort of friction that is dynamic and ultimately productive, activating a new urban space. As Batty notes, "if [a city's] energy inputs were to dissipate or run down, [its] very existence would be in doubt."[8] A city needs a constant flow of energy in and out, to and fro, lest it becomes too stable and inert. Furthermore, as Delanda notes, "contemporary studies in nonlinear urban dynamics teach us that, in many cases, friction (delays, bottlenecks, conflict, uneven distribution of resources) plays a crucial role in generating self-organization. Hence, eliminating it form our models (by postulating about optimizing rationality, for instance) automatically eliminates the possibility of capturing any real dynamical effect."[9] A city must remain dynamic to live, so difference imparts the type of friction necessary to fuel a vitality of space undergoing constant transformation.

Figure 4: Cape Coast Master Plan.

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Figure 5: Rendering, Cape Coast Plan.

CONCLUSION

The relocation of the plan from Accra to Cape Coast posed obvious challenges. External contingencies were severed when the patch was transplanted to a new host. However, the resilience of the plan's internal autonomy paired with its latent capacity to connect outward was sufficient for the plan to engage the new context successfully, while still working as an expanded city center. As Thom Mayne argues, "the true territory for innovation in urban architecture, then, is not in the production of platonic solids, but rather in the design of operational strategies that deal with the multiple and overlapping forces of a highly complex and entirely uncertain 'collective form'."[10] A building that is designed as an autonomous object does not reconstitute what already exists at a place, but instead adds something to a site that is beneficial and new. Urban designs can offer the same service to a city. By designing a patch as an autonomous entity with the capacity to connect outward, we can reconsider the role of urban design and place-making in the world today.

ENDNOTES

1. Thom Mayne, Combinatory Urbanism: The Complex Behavior of Collective Form (Culver City: Stray Dog Café, 2011), 30.
2. Manuel De Landa, A Thousand Years of Nonlinear History (New York: Swerve, 2000), 34.
3. Fumihiko Maki, Investigations in Collective Form, Number 2 (Saint Louis: Washington University, 1964), 33.
4. Fumihiko Maki, "The Megastructure," in Theories and Manifestos of Contemporary Architecture, ed. Charles Jencks and Karl Kopf (London: Academy Editions, 1997), 227.
5. Timothy Norton, Hyperobjects: Philosophy and Ecology after the End of the World (Minneapolis: The University of Minnesota Press, 2013), 82.
6. Maki, Investigations in Collective Form, Number 2, 19.
7. Georg Simmel, On Individuality and Social Forms (Chicago: The University of Chicago, 1971), 292-293.
8. Michael Batty, Cities and Complexity: Understanding Cities with Cellular Automata, Agent-Based Models, and Fractals (Cambridge: The MIT Press, 2005), 353.
9. De Landa, A Thousand Years of Nonlinear History, 41.
10. Mayne, Combinatory Urbanism: The Complex Behavior of Collective Form, 29.