THE RACE IS REALLY THE PRIZE: DESIGNING COMMUNITY CAPACITY IN ECODISTRICTS

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Cities are interwoven diagrams of economic, social and ecological patterns. As our society developed technology to build power lines, dams and levees, food supply networks, and other modern infrastructure we overcame many ecological limitations. As a result, city planning shifted away from ecological concerns to focus primarily on economic and social issues. We wanted to know what economic and social opportunities would arise if a neighborhood reconceived itself by deep planning around environmental systems?

Sustainability frameworks such as the ILBI's Living Cities Challenge (Institute 2011) are changing the practices of urban and architectural design by advocating for urban scale systems that are environmentally performative. The emerging term *ecodistrict* has been used to describe this planning. This planning is often focused on the technical and engineering implications of performative place-making, especially with infrastructure related to distributed power generation, net zero water, and net zero energy. Consequently, *technology* has been seen as the biggest challenge. In our work in urban communities we have observed that while infrastructure—the "hardware" of a community will continue to be a focus for problem solving, the "software" of *community capacity* is the variable that most affects the success of a project. We believe that *community capacity* will be the locus for transformation and the next threshold for design opportunity.

High performing systems require innovative design and engineering, yet the most effective systems require community capacity to imagine, implement and steward the systems. Innovative urban scale systems depend on the community's strength in decision-making, knowledge development, legal structure and financial resources. In this emerging context, our profession will have opportunities to orchestrate community capacity simultaneous to the design of the physical environment. We will need design methods that acknowledge the interrelatedness of social engagement and the built environment. This dual focus aligns sustainability as a wicked problem where technological issues are interwoven with social issues and puts the very definition of community as an issue of design.

This case study examines sustainability through physical place making, as well as the social and cultural infrastructure. Through work with community groups, nonprofits and local government, the concept of an ecodistrict has evolved beyond environmental performance to be both a physical and a social strategy which offer opportunities for design. This study suggests that community resiliency can be created when built environment improvements are coupled with civic engagement; where making place is a community-building act.

UNDERSTANDING COMMUNITY CAPACITY

These ideas were developed and tested in the work done for two adjacent neighborhoods, Larimer and Homewood, in Pittsburgh, Pennsylvania. Pittsburgh was once famous for its convergence of steel, glass and aluminum industries and neighborhoods like Larimer and Homewood were multicultural communities teeming with residents of all ages. As one of Pittsburgh's geographically smaller neighborhoods, Larimer is less than one half of a square mile in area, yet it housed over 13,000 residents at its peak in 1940. (Pittsburgh 2010) As in many postindustrial cities, population declined dramatically after World War Two and by 2010, there were less than 1,900 residents calling Larimer home. The diagram sequence [Figure 1, upper] approximates both use and density and shows the denuding of the urban fabric as houses and businesses were abandoned and demolished.

Larimer recently reached a pivot point when economic growth from adjacent neighborhoods pushed development towards the geographic heart of the community. This development pressure became the impetus for the formation of a neighborhood consensus group via an anchor institution, a historic settlement house called the Kingsley Association. Together with these groups we developed a strategy for stabilization, growth, diversification and ongoing sustenance of the community [Figure 1, lower]. These included a consolidation of vacant land that considered natural patterns for the site and new infrastructure systems for food production, waste management, stormwater management and energy production.

The planning unites economic strategies and social structure with ecological systems and results in a much different diagram that the industrial model of city making. The contrast of this method with the historical urban model is most evident by comparing the diagram of Larimer in 1940 with the projected diagram for 2035 [Figure 1, top and bottom diagrams]. As part of a larger industrial complex, Larimer was predominantly housing and small neighborhood commercial. The plan for 2035, abstracted to the same analytical level, shows

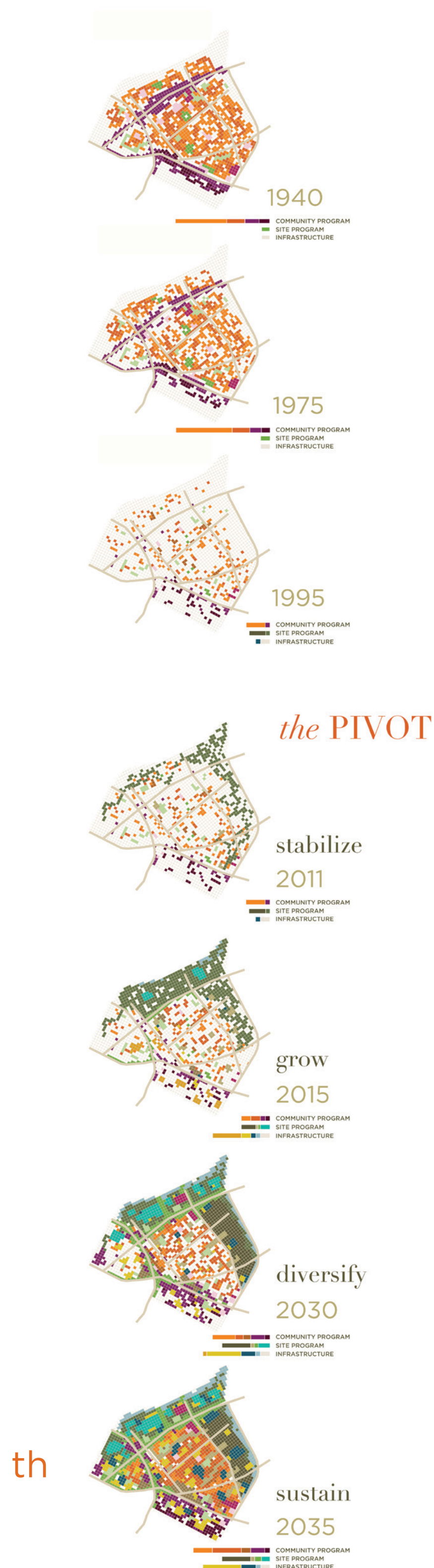

Figure 1. Ecodistricts are more diverse than their urban industrial precedents with decentralized food, water, and energy systems.

far more diversity in uses, with an enriched approach to site program and infrastructure. This signals a shift in infrastructure scale, from the industrial sized to smaller scale, distributed strategies. Resource cycles that had previously been offsite and unrecognized are now within the neighborhood's boundaries and feedback loops for water, energy, food and waste are more visible and accessible.

This leads to a question of methodology and how we discuss urban design. Urban design goals typically address formal and spatial issues; often this is manifest in discussion on urban design strategies that result in descriptions like diverse (social), mixed use (economic), or walkable (physical). The expanded conception of *ecodistrict* extends these ideas to also consider the environmental performance of a community. Ecodistrict planning quantifies system performance, assigns value to ecological processes and promotes social equity with scalar economies.

While at first glance, this emphasis on quantification of systems seems likely to emphasize a technocentric design approach, the ecodistrict focus on three main systems—energy, water, and food—yields some unexpected observations about the nature of community capacity and the potential for civic engagement. In the course of reviewing past plans done for the Larimer neighborhood and for similar settings, we have observed an increasing trend towards environmental urban strategies such as urban farming, rainwater catchment, and renewable energy infrastructure. Indeed, the ILBI's recent Living Cities Competition yields a plethora of strategies that can be employed to "green" a city.

In a slow growth community, these strategies are often opportunistically deployed. A vacant lot becomes a community garden. A dilapidated row of houses becomes low energy demonstration houses. Homeowners are encouraged to install rain barrels. These ideas are admirable, but need to be understood within a matrix of strategies, some more environmentally effective than others. This chart [Figure 2] illustrates many of the typical strategies found in the urban plans that we reviewed. When organized along two axes that describe *time required to implement* the strategy and the *development scale* of the strategy, it becomes apparent that the more effective strategies depend greatly on community capacity. The greater the community's capacity, the more likely it is to be able to implement strategies that are effective due to their scale.

CAPACITY AND THE QUILTED COMMUNITY

Community capacity can be defined in four metrics: decision making mechanisms, organizational learning, legal structure and financial resources. For example, communities that are centrally administered, such as a condominium complex, often have administrative infrastructure, communications channels, legal representation and a financial base that enables them to implement infrastructure scaled strategies such as wetland restoration or alternative energy technologies. This is evident in many of the recently published ecodistrict communities; they are what we call *tabula rasa* ecodistricts, where decision making

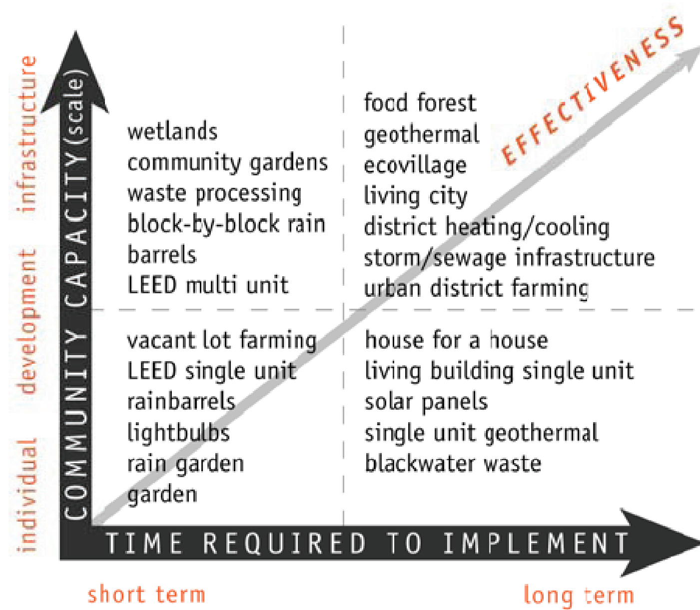

Figure 2. The most effective ecodistrict strategies require high community capacity over time.

mechanisms are newly created and legal and financial resources are consolidated within the development authority. Although the Larimer neighborhood has over half of its original structures demolished it is not a *tabula rasa.* It is what we call a *quilted community* or a community with existing social and physical resources that must be integrated into design solutions. This urban fabric is ubiquitous in our formerly industrial cities.

These neighborhoods are often the focus of participatory planning. These planning processes engage the community to determine values and goals, ideally enabling those that participate in planning to continue with implementation. Results of this process are often focused on the unique or anecdotal aspects of the urban fabric that hold significant cultural meaning. When combined with the relatively "neutral" economic models driven by market research, this type of planning yields a community vision based on social and economic forces.

Ecodistricts that plan for net zero water, energy and food production incorporate the missing aspect of the triple bottom line, the environment. The exercise of quantification of these resources for a community provides a quantifiable and achievable goals by which sustainability strategies can be prioritized and incorporated into the form and meaning of a community. For example, the majority of Larimer residents are economically disadvantaged, with low income households spending over 1/3 of their budgets on energy. When considering questions of equity and economic development, how could energy independence make the community more resilient? As design alternatives were developed, the team calculated the total energy use of each area or building type to anticipate the energy technologies needed to reach net zero energy. Layered systems of technologies were developed and "spark" projects were identified to understand how one might engage the community to embrace this ambitious and long-term goal.

Spark projects are often places with public investment where aggregated property or investment can directly benefit adjacent properties with shared infrastructure. Though at first glance this would seem to be a environmental and economic diagram, it also represents opportunity for civic engagement and the formation of new communities. For example, the creation of an energy district that incorporates existing residents increases propinquity, and create a focused decision making body with increased learning capacity, legal structure and the ability to seek out new financial resources. The physical systems we design have organizational design implications as well.

These interactions between physical environment and social engagement present an entirely different set of questions that can influence our role as designers. Much of the transformation towards sustainable design and construction has resulted from quantitative frameworks like LEED that enable the communication of environmental issues, the development of goals, and the ability to measure effectiveness. While frameworks are often used to describe the physical project (a "LEED certified building"), the use of the framework rewires the structure of the organization itself, a process that we have documented in building scale projects. In this way, we as designers of physical places are intimately involved with the transformation of organizations; this should be an opportunity to expand our design scope to intentionally shape organizations, processes as well as places.

CAPACITY AND ENGAGEMENT

How do we understand civic engagement in the context of community capacity? We have observed three types of engagement, **placemaking**, **programs** and **events**. Each has the potential to rewire the workings of a community; each has potential to become a design opportunity for us and our students. **Placemaking** is the approach we understand best. We might implicitly or explicitly believe that the places we create affect the actions, beliefs and values of the people that experience them. In our research, we have identified specific ways that the process of designing and occupying a building transforms an organization (Mondor 2012). Places are tangible manifestations of a community's values, they require new means of collaboration, they have a defined scope and duration, and they can create "massive change" or immersive displacement of older, less sustainable patterns. Placemaking can be explicitly ecorevelatory, such as learning centers, schools, roof gardens, etc., or can connect people to their environment through less direct but equally effective experiential or functional means.

The second type of civic engagement is through the design of a **program** or activity. The term "program" is not used in the architectural programming sense, but in the algorithmic sense that describes the rules or procedures that formally or informally guide

Figure 3. Ecodistrict development.

behavior. These might be explicitly educational, like a workshop or class that informs an audience about some environmental concepts. They also might be economic, such as a utility that sponsors an neighborhood energy savings competition and subsidizes efficient technologies. Programs can also be implemented at the policy level, such as zoning regulations that incentivize environmentally beneficial decisions through a combination of "carrot and stick" means. Highly effective programs are able to use the tangible qualities of geography and place to give their program identity, and in the process, they change or create community identity.

This segues to the third type of civic engagement and the one that is perhaps most interesting to us as designers. There is an emerging body of work centered around the **event-based strategies** and how this can effect social norms. This has been one of the intentions (or byproducts) of artist installations —a temporary displacement of beliefs and behavioral patterns through a physical or programmatic provocation. This is related to works by environmental and installation artists, as well as the Situationists. More contemporary examples include the concept of "pop up" storefronts like the writing focused 826 Valencia that models novel environments in recognizable contexts (826 Valencia 2012). Volkswagen's concept of "fun theory" installations change the properties of an environment to encourage different behavioral patterns without explicit reference to the purpose (Volkswagen 2009). Ezio Manzini's "scenarios" designed different business models that challenged relationships between us and our artifacts and places (Manzini 2009). While these events were often created as part of an artistic oeuvre of work, their effectiveness has been a focus of emerging social science reseach on behavioral theory.

When these principles are thoughtfully employed within an ecodistrict, they create multiple ways for people to engage with the concept of environment and increase the community capacity. We observed this pattern in Larimer and are working with the community to intentionally use these tools to reach their ecodistrict goals. For example, when considering water, design alternatives were generated at the same time as we analyzed the neighborhood stormwater profile. The resulting recommendations addressed **place-based strategies** where significant investment could be leveraged in the public realm. For example, Water Streets were designed to daylight stormwater infrastructure in residential sidewalks and would create a proxemic based community identity. Larger infrastructure scaled strategies such as the Blue Necklace would improve the ecological habitat in the adjacent park with urban wetland regeneration and would intentionally imply territorial ownership of an area previously considered "no man's land." In denuded communities, the liminal quality of open space can be both an asset and a liability and the identity of the community is shaped as these sites are intentionally transformed.

Program-based strategies were recommended as companions to public realm and infrastructure investments. These strategies typically involve a small commitment to action by a broad group or community members, with each individual's action aggregated into measurable

benefit. Initiatives can center on small scale technology deployed in multiple locations, such as a Water Garden program that would encourage homeowners to create infiltration gardens through education and incentives that offset future fees and costs. These strategies work best when they are physically evident within a district geography and have specific means of group engagement. Early participants become the proof-of-concept demonstration projects; the tipping point occurs when the number of participants sets a new foundational identity for the district and the action becomes the new social norm. As a design opportunity, the creation of a program or algorithm for action can shape our environment as much as a detailed design solution.

Event-based strategies are often the first to be implemented because they are small in scale and do not require great community capacity to mobilize individuals to action. Currently a number of residents and artists in Larimer have embarked on demonstrations of water strategies as a series of art installations. Because of the magnitude of the runoff reduction and infiltration goals for the neighborhood, these somewhat anecdotal efforts are more effective at building the community capacity than they are at significant reduction of stormwater. As a design opportunity, this becomes an ideal environment to prototype ideas that test technologies and stretch community understanding of its value.

When these strategies are considered as an ecosystem of actions that create community capacity, the designer is seen as a transformational agent that engages people, process and place. In this way, environmental sustainability is less a technological issue than a result of community formation. Working together to solve energy, water, food and other environmental issues becomes a way to redefine how we form community bonds and it opens new opportunities for designers to engage communities in both placemaking and in relationship building. In making resilient communities, the race is really the prize.

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