Sustainable Urbanism: Vision and Planning Process Through an Examination of Two Model Neighborhood Developments

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Abstract

The emergence of the concept of "sustainable development" has provoked an interesting discussion about the physical, technological, and socioeconomic attributes of the sustainable city, but less has been said about the role of planning in achieving them. This paper explores the planning processes underlying two new neighborhood developments broadly regarded as exemplary sustainable districts: Hammarby Sjöstad in Stockholm, Sweden, and Quartier Vauban in Freiburg, Germany. I find that planning was *proactive*, in that the local government had considerable powers and resources to implement the plans; *visionary* and *goal-oriented*, in that planners pursued an integrated vision of interrelated goals and devised the means to achieve them; and *collaboration-intensive*, in that planners focused on increasing technical capacity and on building alliances with stakeholders. These empirical findings suggest that cities that want to pursue sustainability should adapt their planning process towards incorporating these characteristics.

Keywords: Sustainability, planning process, sustainable development, Sjöstad, Freiburg

Introduction

The incorporation of sustainability-driven principles into planning thought has resulted in a vast array of city plans, reports, and programs with an explicit sustainability focus. Less widespread, though, has been their integration into mainstream land use planning and urban development. This discrepancy does not simply represent an "implementation deficit," but the struggle to interpret the impact of the idea of sustainability on the planning process (Owens and Cowell 2002). Against normative views of the sustainable city, there remains significant ambiguity about the role of planning in the face of the sustainability impetus (Davoudi 2001). On the other hand, the gap between aspiration and practice may be narrowing, as evidenced by a number of recent studies documenting successful planning strategies and "green developments" (see, for example, Gilbert 1996; Farr 2008; Newman et al. 2009). However, documentation usually stops at a description of successful sustainable features and a celebration

of the respective cities' progressive nature. Rarely is an explanation attempted for the underlying reasons for success and its intricate link to planning and implementation strategies that could be emulated by other cities.

In this paper, I seek to address this gap by analyzing two case studies that illustrate the relationship between sustainable outcomes and planning processes. I use two recently constructed neighborhood developments that are broadly regarded as successful examples of "sustainable urbanism": Hammarby Sjöstad in Stockholm, Sweden, and Quartier Vauban in Freiburg, Germany.[1] The analysis shows that in both cases planning was *proactive*, in that the local government used considerable powers and resources to implement the plans; *visionary* and *goal-oriented*, in that planners pursued an integrated vision of interrelated goals and devised the means to achieve them; and *collaboration-intensive*, in that planners focused on creating and improving technical capacity and on building alliances with targeted stakeholders. In both cases, development was led by public agencies. However, the involvement of a group of citizen activists in Quartier Vauban resulted in further-reaching social and environmental outcomes.

The findings suggest that planning for sustainable urban development entails defining and actively promoting a vision of sustainability, but taking a collaborative, rather than top-down, approach to realizing it. Cities seeking to make the principles of sustainable urbanism their normal practice can learn from the experience of these two cases.

Methodology

The paper is structured in three sections. First, I summarize the principles commonly associated with the rubric of "sustainable urbanism" and review some of the challenges of translating them into planning practice, based on the related literature. Next, I discuss how the two case studies represent sustainable urbanism outcomes. Then the main findings of the study are presented, in an examination of the planning processes that led to the realization of the neighborhoods. My analysis is qualitative and based on conclusions from semi-structured interviews conducted during 2010 with planners from the city administrations, citizen activists, and participating architects and developers, combined with data collected from city plans, news reports, and site visits. In the concluding section I discuss the implications of these findings and make recommendations.

1. The acceptance of the two neighborhoods as successful models of sustainable urban development is widespread. For Hammarby Sjöstad see Beatley (2000) and Dastur (2005); for Vauban see Scheurer (2000), Newman et al. (2009), and Broaddus (2010).

Planning for Sustainable Urbanism

Efforts at defining sustainability policy inevitably reveal conflicts among the three priorities of sustainable development: economy, equity, and the environment. Although sustainability's holistic, unifying quality is appealing as a long-term vision for planning, its hegemonic use in short-term goals may be naïvely idealistic and difficult to break down into measurable outcomes (Campbell 1996). Further, the elusive goal of meeting economic growth and intergenerational equity within the long-term limits of the planet's natural systems has been described as a political compromise between the irreconcilable ideas of neoliberal economic development and environmental conservation (McManus 1996).

Despite the challenges of defining the scope of sustainable development, there has been remarkable consensus on the physical, technological, and socio-economic attributes of the sustainable city. In the case of urban development, they can be summarized under the rubric of "sustainable urbanism," as displayed in Table 1.

SUSTAINABLE URBANISM			
	Contain urban expansion	> impose urban growth boundary > protect sensitive areas > reuse existing land and infrastructure	land use and urban design
	Create healthy, green environments	> integrate natural systems in urban environments > eliminate pollution in the air, soil, and water > provide good micro-climate and protection from noise > design attractive and safe public spaces	
	Develop compactly	> build densely > incorporate mixed uses	
	Encourage green forms of mobility	> implement efficient public transit > discourage car use > provide infrastructure for walking, biking, car-sharing	
	Support renewable systems and circu-lar metabolism	> use renewable energy sources > reuse system outputs as inputs > conserve resources on-site > reuse and recycle materials	technology
	Design buildings that consume mini-mal resources	> use energy and water conservation measures > employ low-impact materials > use passive architecture	
	Establish economic activity	> create job ooportunities > encourage commercial activity	community & economic development
	Create equitable, livable places	> provide affordable housing > provide common facilities > encourage community relations	

Table 1 The principles of sustainable urbanism

Regarding land use, sustainable urbanism calls for limitations to urban growth, high utilization of built-up areas, and re-use of existing sites within city limits. Besides the preservation of landscape and the protection of biodiversity and biologically productive resources (Beatley 2000), evidence is mounting that compact development also contributes to reduced energy consumption. Newman and Kenworthy (1989, 1999) have shown that single-use low-density development requires individuals to travel long distances via private automobiles to reach their destinations, and makes public transit impractical. The viability of casual encounters and non-residential uses within walkable distance requires residential densities of at least four units per acre. The location of new development close to the city center and existing amenities also reduces the amount of everyday traveling, at least in cities with established city cores (Næss 2006).[2] At the same time, providing attractive public transit, encouraging biking and walking, and making private automobile use expensive further reduce vehicle miles (Newman and Kenworthy 1999; Pucher 2008). Moreover, sustainable urbanism asks that urban design should enhance the quality of the public realm with common spaces, pedestrian streets, and "traffic calming" measures, and density should be combined with sufficient green areas to improve microclimate, protect from noise, enhance air and soil quality, and provide recreation opportunities (Newman and Kenworthy 1999).

In parallel with land use and urban design imperatives, the technological paradigm of sustainable urbanism is gaining ground. It focuses on resource management through technological improvements; for example, renewable energy sources (hydroelectric, biomass, solar, and wind), more efficient energy production, and reductions in energy and water consumption and waste production at the building and the neighborhood level (Scheurer 2001; Newman and Kenworthy 1999).

Finally, sustainable urbanism calls for economically and socially sustainable urban development. These parameters are more difficult to put into practice. Indicators of a vibrant local economy include the financial success of a development, sustained local economic activity, and job creation. On the other hand, social sustainability may refer to equitable access to housing and facilities, well-developed community networks that help build trust and respect, and place-making that encourages a sense of identity (Gilchrist 2000).

2. Although the model of "compact city" is prevalent, there have also been critical voices, particularly against the validity of the claimed connections between urban form and travel behavior. See, for example, Breheny 1996, Crane 2000.

The Role of Planning

If the principles of sustainable urbanism provide a guide to successful urban development, they do not explain how to make it happen. As planning is inherently political, the implementation of sustainability requires that someone assign values and judge what should be prioritized (Owens 1994). Which planning processes might lead to sustainable outcomes? The ambiguity between process and outcome in sustainable development is manifest in the detachment of procedural planning theory from the discussion of the physical and technological features of the sustainable city (Næss 2001). However, in sustainable planning such detachment "appears to be particularly inappropriate, as the recommendable procedures will most likely depend on the goals and policy issues dealt with" (ibid: 504). For example, if consumption patterns that are deemed unsustainable are prevalent, their change will hardly emerge through bottom-up strategies.

According to Davoudi (2001), planning has always had two faces: the one proactive, ideological, visionary, promoting spatial strategies, and the other regulatory and neutral, focused on reconciling conflicts of interests on the use and development of land. The latter has prevailed since the 1970s, along with a devaluation of physical planning. But Davoudi believes that sustainability provides a "vision" that can resurrect the role of planning for the "common good." Breheny (1996) also puts it succinctly:

> The sustainable development imperative has revived a forgotten, or discredited, idea: that planning ought to be done, or can be done, on a big scale. Up to the 1960s planning had a long, and reasonably creditable, history of visionary ideas. After that date, the public lost confidence in planners, and planners lost confidence in themselves. Subsequently, pragmatism has ruled. However, there is now a fascinating debate underway about the role of planning in promoting sustainable development, and … about which urban forms will most effectively deliver greater environmental protection. (1996:13)

The strong "outcome ethic" that permeates the literature on sustainability leads to favoring a proactive role for planning, and sits uneasily with "a vision of planning as a neutral forum for arriving at consensus about policies" (Owens and Cowell 2002: 8). This role for planning is usually advocated for by communicative models prevalent in the last three decades that claim that negotiation can transform conflicts of interest into "win-win" situations, or that local democracy and dialogue can forge mutual understanding and agreement (Susskind and Cruikshank

1987; Healey 1997). But the long-term nature of the environmental goals and the need for an integrated approach make the possibility of reaching consensus among different stakeholders, who have different short-term priorities, unlikely. Stakeholders with more access to resources, such as development interests, may end up dominating the process (Logan and Molotch 1987). Neither is a role of planning as a facilitator of markets likely to deliver sustainable outcomes, as market processes are unable to take into account externalities, such as pollution or social exclusion (Næss 2001).

Instead, in its visionary, proactive view, planning is seen as an institution for promoting particular ends, specifically sustainable urban form. This may sound like the vague idealism of a unified public interest that was the critique of comprehensive planning fifty years ago (Campbell 1996). However, the visionary planning of today is also inclusive, democratic, and characterized by intensive communication and collaboration; ideally, it provides "a different kind of dialogical space in which particular conceptions of the good might be fostered" (Owens and Cowell 2002: 7). The promotion of the sustainability vision should go in parallel with translating sustainability according to the priorities of different groups, thus counteracting manipulation and "distorted information," as suggested also by some communicative models (Forester 1980).

The Neighborhoods

Hammarby Sjöstad in Stockholm and Quartier Vauban in Freiburg are both successful applications of sustainability principles in new urban development. Hammarby Sjöstad (HS) is a massive mixed-use urban project extending over 160 hectares (400 acres) of land and 40 hectares of water, replacing an industrial area around Stockholm's Lake Hammarby. The development is carried out in twelve phases; construction started in 1997 and about seventy percent of the development has already been completed (Figure 1). Fully built-out, HS is projected to accommodate 35,000 people, living and working in 9,000 housing units and 400,000 square meters of commercial and office space.

Quartier Vauban (QV) has gained a measure of fame as one of the most innovative examples of an ecological community. This new neighborhood of 41 hectares (101 acres) with a projected 5,500 inhabitants was planned in a site previously occupied by French troops, bordering the Black Forest. Construction started in 1997, occurred in four phases, and had mostly been finished by 2006, although a few lots are still being developed (Figure 2).

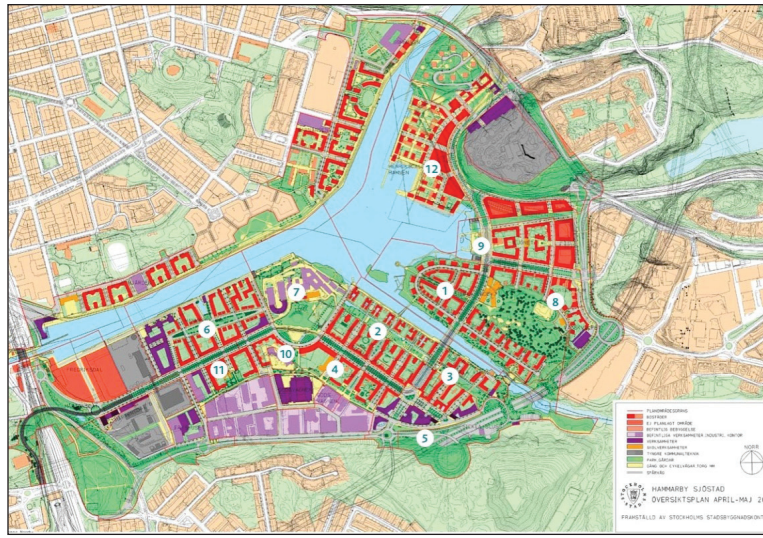

Figure 1 Masterplan of Hammarby Sjöstad. The numbers correspond to the project phases. 1: Sickla Udde, 2: Sickla Kaj, 3: Sickla Kanal, 4: Kölnan, 5: Sjöstadsporten, 6: Hammarby Gård, 7: Luma, 8: Forsen, 9: Lugnet, 10: Godsfinkan, 11: Proppen, 12: Henriksdalshamnen.

Source: Stockholms Stad.

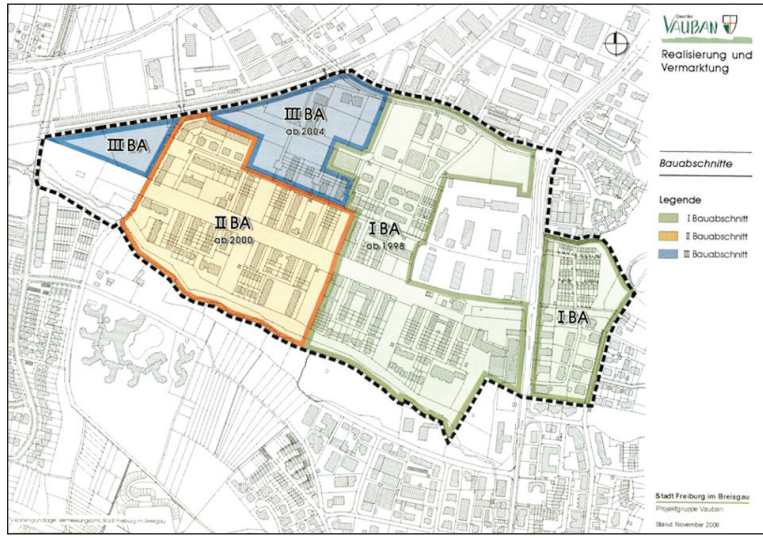

Figure 2 Vauban project phases with starting dates.

Source: Stadt Freibrug Im Breisgau.

HS and QV are similar in many respects, as seen in Table 2. They are both mixed-use compact developments, close to the respective city centers, served by various modes of public transit and walking and biking infrastructure. They boast innovative buildings and infrastructure, support a vibrant social life, and are very popular, especially among families with young children. HS is most famous for resource management through the "Hammarby Model," which integrates conventional systems for district heating and sewage treatment into an eco-cycle, using the outputs of one process as inputs for another. QV is exceptional in its mobility concept, with more than half the entire district being "parking-free": cars may enter the residential streets for pickup and delivery but cannot park there, and vehicle owners are obliged to buy a parking space in the two peripheral communal garages.

The incorporation of such a wide range of sustainability measures in these neighborhoods has led to their acceptance as successful models of sustainable urban development. They qualify as successes not just

SUSTAINABLE URBANISM		
Contain urban expansion	> development within city limits > 5km from Stockholm city center > adjacent Nacka Natural Reserve > reuse of industrial land and infrastructure	> development in former military site > 3km from Freiburg city center > adjacent Black Forest > 10 out of 25 historic buildings retrofitted as student dorms, cohousing, workshops, and kindergarten
Create healthy, green environments	> preservation of riparian vegetation and oak trees > central park for leisure and stormwater retention > reed and oak park, elevated boardwalk, footbridges > use of eco-certified products in public spaces	> preservation of 60 year-old trees and stream > 10% of the area as public green space > green strips between buildings for local breeze > natural materials, green facades and green roofs
Develop compactly	> average residential density of 133 people/ha > five- to seven-story perimeter blocks > mixed uses: offices, small retail, restaurants, schools, sports infrastructure, environmental center, library, senior center, student housing, center for handicapped children	> average residential density of 100 residents/ha > two- to four-story buildings > mixed uses: small retail, cafe, community center, schools, offices
Encourage green forms of mobility	> ferry line (since 2000), numerous bus lines, light rail line (since 2002) > 1.5 bicycle parking space per household > 0.7 car parking space per household > car-sharing club > 30 km/hour speed limit > footpaths and bikepaths > narrow sections and raised crosswalks	> tramway line (since 2006) > "parking-free" district with high cost of owning a parking space > car-free household association with car-sharing club > loop-type road connections to prevent through traffic > 30 km/h speed limit > ample bike parking > bike and foot paths
Support renewable systems and circular metabolism	> some rooftop photovoltaic panels and solar collectors > reuse of wastewater treatment bi-products: fertilizer for farming, biogas for municipal vehicles, and waste and used water for 80% of district heating needs > stormwater management on-site > separation of household waste through automated disposal system	> 1,200 m2 of photovoltaic panels and 450 m2 of solar collectors > own cogeneretation plant powered by wood chips > comprehensive rainwater management open channel system "mulden-rigolen" > garbage sorting
Design buildings that consume minimal resources	> energy used for heating and electricity: 100 – 150 kWh/m2a > water consumption: 140 l/person/day > reductions in metal, new gravel, sand, and energy during construction	> energy used for heating and electricity: 120 kWh/m2a (65 kWh/m2a for heating) > passive houses: 15 kWh/m2a for heating > Solar Settlement with "plus-energy" houses > new generation timber-frame construction > low-flush toilets and controlled ventilation systems
Establish economic activity	> popular among young families > living space easy to fill > commercial rented space slow to fill > significant "eco-tourism" destination	> popular among young families > difficult to market innovative housing > few employment opportunities > contribution to regional solar economy
Create equitable, livable places	> 50%-50% balance between rental housing (leased to municipal housing companies) and condominiums (sold to private developers) > family-friendly environment > exclusion of low-income population due to rising land prices	> economic inclusion aided by building cooperatives (25% savings to construction costs) > 10% subsidized housing > family-friendly environment > exceptional community life with many local informal groups

Table 2 Sustainable urbanism features in Hammarby Sjostad and Quartier Vauban

in concept, but in terms of measurable outcomes. For instance, recent surveys in HS showed that 70 percent of trips there involve public transit, walking, or biking, while in QV a 2002 study showed that only 28 percent of trips by car-owning households—and 2 percent of trips by car-free households—were made by car, even before the introduction of the tram (Broaddus 2010). Another survey (2009) showed that in QV there were only 157 cars per thousand inhabitants, compared to 367 per thousand for the city of Freiburg and 524 for the state of Baden-Württemberg.

In terms of resource consumption, a 2008 report for HS showed a thirty to forty percent reduction in greenhouse gas emissions, acidification, overfertilization, ground level ozone, radioactive ozone, non-renewable energy, raw materials, and water consumption, in comparison with conventional new construction of the early 1990s (Grontmij 2008).[3] For Quartier Vauban, a 2002 research project by Öko Institut identified potential overall reductions in use of minerals and production of CO2 and SO2 emissions, but it was based on assumptions and not measurements. There is evidence, though, that passive houses provide 30 percent energy cost savings (while costing only 3 percent more than conventional houses to build), and the experimental "plus-energy houses" use only 15 percent of the energy needed by typical Freiburg homes.[4]

The documentation of environmental successes is more prolific than that for economic or social features. So far, both developments have been popular and easily marketable, but this achievement has inflated land prices. This is somewhat amplified by the balance between renters and owners, and in the case of QV the presence of building cooperatives ("baugruppen") that allowed people of moderate incomes to achieve homeownership by saving up to 25 percent of the construction costs. The envisioned work-live environment was only partially attained, as retail and office space has been slow to fill, particularly in HS, and the overwhelming presence of young families raises questions about future demographics. Despite these concerns, family and social life in the neighborhoods is booming and residents enjoy healthy environments with excellent public space and facilities.

3. The Grontmij report concerned buildings in the first four fully built-out districts of Hammarby Sjöstad: Sickla Udde, Sickla Kaj, Lugnet, and Proppen.
4. The "plus-energy houses" are part of the "Solar Settlement," an innovative demonstration project that also includes the "Solar ship" (Sonnenschiff), an experimental hybrid of houses and offices. Thanks to extensive photovoltaic installations, the plus-energy houses produce 36 kWh/m2a of electricity that is fed back to the grid. The heating costs of a plus-energy house amount to 150 to 200 euros/year, less than ten percent the costs of a conventional house.

Planning Processes for Sustainable Urbanism

Hammarby Sjöstad and Quartier Vauban share similar attributes of sustainable urbanism, but were those achieved through similar planning and implementation mechanisms? To attempt an answer to this question, I will outline the main characteristics of the respective planning processes, by examining three sets of features:

> *Control of the planning process*: authorship of the plan (public or private, single or multiple), resources devoted, degree of local government control over implementation *(proactive versus reactive planning)*.
>
> *Vision, goals, and means*: presence of a comprehensive vision, goals set forth from the beginning, measurable targets or limits set, degree of emphasis on procedure *(goal-oriented versus process-oriented planning)*.
>
> *Communication and collaboration strategies*: degree and quality of stakeholder participation, quality and focus of communication and coordination among actors *(consensus-building versus alliance-building planning)*.

Each of these is considered in turn.

Control of the Planning Process

The Stockholm City Planning Administration drew the first plan for Hammarby Sjöstad in the early 1990s, concerned with the remediation of the polluted site and the housing shortage experienced at the time, but the idea only took root when Stockholm decided to bid for the 2004 Olympic Games in 1995 and HS was designated as an Olympic site with housing and sports venues. The Project Team for Hammarby Sjöstad was created in January 1997 to bear responsibility for the masterplan and the environmental management of the project. The team had independence to handle financial issues and make planning decisions, and consisted of a head, a secretary, and seven representatives from the City's Office of City Planning, Office of Roads and Real Estate, and Office of Environment, and the municipal companies for energy, water and waste (Svane 2007). When the Games were granted to Athens, the team came up with a new masterplan for housing that determined land uses, lot subdivisions, provisional allotment of housing types and public amenities, and design guidelines.

In the first decade of development, thirty to forty employees worked exclusively on the project, according to a city engineer. Staff came from

the City Planning and Development administrations, and to a lesser extent from the Environment and Traffic administrations. For each phase of the development, they prepared separate "detailed plans." Detailed plans (detaljplan) are the most important planning instrument in Swedish planning practice, prepared when development is expected. They are legally binding and specify at a minimum land uses, public spaces, building lots and an implementation period, but can also cover design, construction materials, lot sizes, floor areas, landscaping, parking, and conservation (Kalbro and Mattson 1995). In practice, negotiations with developers that determined price, housing type (rental or ownership), building height, floor-area ratio, design elements, and energy issues took place before the detailed plans for HS were finalized. Nevertheless, the plans reflected the municipality's principles about fair division between tenure forms and different types of developers. Architects from the City Planning Administration worked in close collaboration with design firms to define the architectural character, materials, colors, etc. The public spaces, streets, and energy and water plants were designed, planned, and implemented by the city's administrations. The project was funded by the city budget and refinanced through the sales of the lots.

In Freiburg, the plan for Quartier Vauban was developed when a large parcel of land became available upon the closure of a French military base on the city's edge. Like Hammarby Sjöstad, the rationale was to provide housing for families of various income levels. Having purchased the property from the federal government, the city of Freiburg organized a design competition in 1993. Shortly after, a group of citizens who wanted to influence the development of QV towards social and environmental goals put together an independent NGO named Forum Vauban. Representatives from the City Council, the City Planning and Building Office, Forum Vauban, and other consultative members formed a special committee that, according to Forum members, functioned as the main platform for information exchange, discussion, and decision preparation. A project group of five to seven employees from the city's Planning and Building Office, working closely with the city's property trustees, was responsible for implementing the decisions of the committee and for the project budget. In German planning practice, the local land-use plan (Bebbauungsplan-BBP) contains legally binding designations for urban development and an environmental assessment (Newman and Thornley 1996). For Quartier Vauban, a project-based BBP was prepared according to the competition's winning design. Within eight years (1999-2007) the plan was amended five times to incorporate changes that emerged through meetings of the Committee. The city gradually released the lots in phases by inviting interest from developers or "baugruppen," and using the proceeds from sales to fund infrastructure and amenities for the next phase.

Both case studies exemplify proactive planning, with a public agency controlling all phases of plan construction and implementation. The political leaderships chose to be proactive, but were certainly helped by national planning systems that have "considerable powers and resources to ensure the implementation of their plans," as opposed to reactive systems that "(rely) on the initiative of others, notably the private sector, for their plans to be implemented" (Davies 1996: 223). Definitely, these municipalities do not initiate all development within their borders, but new development must conform to their land-use plans that are renewed every five years (in Freiburg) or ten years (in Stockhom). In HS and QV, the municipal planning administrations partnered with private developers, but by gradually releasing lots they ensured that no one developer could substantially influence either process or outcome. Planners achieved sustainable outcomes either by executing them in design and infrastructure, or by setting the context for the private sector to do so.

The proactive role of planning appears to be more important for land use and urban design, and less so for technological innovation and community development, except for the inclusion of affordable housing (which was dependent on public provision). The attributes of containment, compactness, environmentally-friendly design, green space, and public transit were most clearly ensured by planners in the neighborhood plans. But HS and QV differ somewhat. In the former, responsibility for planning rested upon the city planning administration, in collaboration with other public agencies, whereas in QV the nonprofit Forum Vauban was instrumental, particularly for the development of community networks and in organizing residents to be proactive, for example by participating in the design of green spaces.

Vision, Goals, and Means

At the time of conceiving Hammarby Sjöstad, the compact city ideal was becoming popular and, in the words of a city planner, HS was envisioned as "an extension of the city center with an urban character and the same spatial and architectural qualities as the city center." HS reflected the motto "build the city inwards," adopted in the 1999 Comprehensive Plan that designated twelve "strategic development areas" close to the inner city, including Hammarby Sjostad. These designations were a reflection of planners' will to pursue an environmentally conscious urban form, and of politicians' support for traditional urban qualities. The latter also wanted to produce a landmark project: Upon the Olympic bid, the city compiled the "Environmental Program for Hammarby Sjöstad" (1997) according to which the district would "be planned and built from a strictly ecological approach as a resource-saving and

environmentally friendly neighborhood, and be at the international forefront of sustainable development in a dense urban environment." Its overarching goal was that the area's environmental performance should be "twice as good in relation to the best applied technology in new building design today." The goal was broken down into numeric targets for energy, transport, material flows, water and sewage, and building materials. When Stockholm lost the Olympic bid, the program ended up with a less prescriptive character. However, the "twice as good" imperative exerted a powerful influence on the subsequent process, and public agencies methodically strove to implement its targets. This proved more challenging for private developers, who considered targets about energy and resource-saving construction methods unrealistically ambitious (Bylund 2003). The Project Team was reluctant to impose them and devised "softer" strategies such as information campaigns, seminars for architects, and the preparation of an Environmental Design Guide.

Freiburg's planning documents also expressed a bold vision about spatial development, with an integrated approach to land-efficient urban development and transportation including the tram system and extensive infrastructure for pedestrians and bikes. The city's 1996 climate protection concept called for CO2 emissions to be reduced by 25 percent by 2010. To achieve this reduction, the city introduced a series of measures, including the "low-energy standard," according to which every new property built on municipal land must consume no more than two thirds of the legally permitted energy use ceiling in Germany. QV was a test case in which means to achieve ecological innovation were devised on the spot as scientific knowledge advanced. Other targets, particularly those related to energy, were ensured through binding instruments such as development agreements, in which city engineers were assigned the task of controlling building performance. Here also, political support and alliance with a powerful grassroots organization, Forum Vauban, was important for the most innovative of measures to be implemented.

It appears thus that in both cases planners came up with broad, visionary goals, broken down into specific targets and the means to achieve them. The process was rational and scientifically based but not devoid of messy politics: although the city planning administrations had relative autonomy in decision-making, politics did intervene, with ambiguous results on sustainable outcomes. In a study of conflicting perspectives in the development of HS, Vestbro (2007) showed the negative influence of changing city governments on land ownership, balance of tenure forms, and environmental innovation. On the other hand, planners' insistence on meeting targets often made them reluctant to experiment with innovative solutions, and that is where political support proved crucial. The process was not always linear, and in fact goals often co-evolved. For example, citywide land use plans did not lead to new projects but were

formed in parallel. Planning in the two case studies did indeed reflect a technology optimism, and it was hardly possible not to, considering technology is one of the prime means to achieve sustainable outcomes. Indeed the focus on quantifiable targets worked well toward achieving the imperatives of the technological paradigm of sustainable urbanism.

Communication and Collaboration Strategies

When the development of Hammarby Sjöstad was decided, officials were aware that they were embarking on experimental planning, and therefore needed to engage more resources towards capacity-building. Early on, the focus was clearly on fostering technological competence to achieve environmental solutions. The Environmental Program indicated that evolving research would inform the successive phases of development, and that operational and educational objectives should be reached in parallel. It also emphasized cooperation and active engagement of all actors, namely the city, landowners, developers, contractors, administrators, and operators, along with the need to build consensus in early stages of the planning process. In the first phases of HS, the project team disseminated information broadly, organized seminars for architects and developers, developed a computerized building performance tool (Environmental Load Profile), and created GlashusEtt, an environmental information center housed in an ecologically innovative building, to spur environmental awareness among the new residents.

In parallel with these information-intensive initiatives, planners embarked on alliance-building activities. The interrelated nature of sustainability goals required that the impulse for isolated sectoral approaches be overcome and interdepartmental coordination fostered. The city administration elicited support from the utility companies to implement innovative energy supply and water management schemes by including representatives from the utilities on the Project Team. Also, planners fostered a collaborative climate with developers through incentives, such as grants to cover the additional costs of innovative building technology, and through continuous communication. Eventually, everybody learned from the process and developers voluntarily improved environmental performance in the parts of HS that are now under construction.

Similarly, in QV communication strategies included the broad exchange of information among city officials, developers, scientists, politicians, and the public, as well as alliance-building. The city also offered financial incentives for the use of solar technology and for making car-free mobility attractive. But unlike HS, strategies targeted not only developers and public agencies, but also co-building groups and prospective residents, and were geared to achieving both environmental *and* social outcomes.

The catalytic agency in that respect was Forum Vauban; in collaboration with the city, the Forum published a bimonthly magazine, brochures, and manuals about resource-saving construction; organized biking tours, information fairs, excursions, and workshops for future homeowners, architects, craftsmen, builders, and financial institutes; supported co-building groups on technical, financial, and legal aspects; sought to cultivate partnerships with universities, research centers, and institutions, which helped inform the technological choices, build confidence in the project missions and disseminate the results (for example, with the International Council for Local Environmental Initiatives (ICLEI), the German Environment Foundation (DBU), and the EU program LIFE; and launched the international conference "Urban Visions" together with ICLEI.

The results were dramatic. According to a Forum member, in the beginning there was not much interest in passive houses nor support from the city planners, but as the first efforts proved successful, more building groups opted for passive house construction and city planners prioritized those groups. The parking-free concept, the wood-chip-fueled cogeneration plant, and the abundance of passive houses in Vauban also originated from Forum suggestions. A planner from Freiburg's city planning administration admits that planning for Vauban was more timely and engaging than any other project they had worked on before; in the beginning planners were reluctant to change their established routines but eventually they recognized it was well worth including Forum Vauban in decision-making processes. The Forum proved a powerful ally not only for environmental and social innovation but also for building community networks in the district.

In both case studies, then, planning was communication-intensive, collaborative, and set strong precedents for future action. But rather than trying to build consensus among all stakeholders, the cities selectively included stakeholders that could contribute to long-term capacity. The absence of channels for certain groups such as the business community and property owners to advocate for their own interests, and thereby delay implementation, gave the cities considerable leeway to pursue their goals unobstructed. Yet there is a difference between the two case studies. Participation of future residents was practically nonexistent in HS; conversely, in QV participation was catalyzed by a group of progressively minded citizens to include groups that could help achieve sustainable outcomes. The degree of social cohesion, community relations, adherence to an ecological lifestyle, and small-scale environmental innovation achieved in QV is not present in HS. This story shows that facilitating dialogue and building consensus within groups that share common values can foster actionable outcomes.

Factors Outside the Planning Process

Certain underlying factors present in the local contexts of Stockholm and Freiburg facilitated the realization of these neighborhood developments as "pilot projects." These factors, which were independent of the planning processes described earlier, helped minimize conflicts between environmental priorities and socio-economic goals. Yet recognizing their contribution should not diminish the importance of planning choices.

Municipal land ownership. Stockholm and Freiburg have large land reserves that allowed them to eliminate potential conflicts with private land owners by choosing where to put development and circumventing the cost and delay of purchasing and assembling land. This has deep historical roots; for example, after World War II, Sweden's central government encouraged municipal land banking and extended expropriation laws to help municipalities keep reserves for housing (Newman and Thornley 1996).

Sympathetic political climate. Both cities have political support for environmental measures and continued presence of green parties in city councils. The rise of environmental sensibility was partly due to environmental conditions that had galvanized political action in the past, specifically the cleaning of Lake Mälaren in Stockholm in the mid-1960s and aversion towards a new nuclear plant planned for Freiburg in the mid-1970s. This political climate minimized conflicts about development priorities and provided momentum and grassroots pressure for innovative processes.

Presence of an environmental innovation industry. In the development of HS and QV, the cities invested mostly in technological areas where they already held strong positions. The Hammarby Model tapped into existing technology for storm water and sewage treatment, waste management, energy, and heating that had been developed in Stockholm since the 1970s, resulting in an extensive district heating network and plants for water treatment, recycling, and waste incineration. The city of Freiburg adopted a future-oriented energy policy in 1986, based on three pillars: energy conservation, new technologies such as combined heat and power, and the use of renewable energy sources. Thus many solar industry and research organizations were attracted to the area, giving higher value to government-sponsored incentives. The presence of this industry minimized potential conflicts about investment in environmental technology.

Educated and prosperous population. Stockholm and Freiburg have relatively prosperous and homogenous populations receptive to experimentation and collaboration. Population characteristics pertinent in the two cities,

such as creativity in relation to urban change, innovation, openness to new ideas, high quality of life, and high educational level minimized aversion to change and conflicts about distribution of resources among social and environmental goals.

Discussion

The question of how to get from the rhetoric of sustainable urbanism to the reality of sustainable neighborhoods is a neglected one. In this paper I traced some features of the planning process crucial for making HS and QV two of the most comprehensive examples of "sustainable urbanism" today: municipal control, vision-setting, and alliance-building.

The conflict-prone nature of sustainable land use planning suggests that a proactive role by local public authorities is important for the endorsement of the value-laden concept of sustainability. When local governments, rather than solely relying on private initiative, are able to lead with innovative measures and spatial strategies, they become trendsetters for sustainable urban development. Local planners can promote a community-based definition of sustainability as common good and its application in project implementation and delivery. They can also set strong, courageous visions for urban environments that respond to local needs while addressing global concerns.

This type of planning power differs from the heavily criticized top-down, state-driven planning of the postwar years, as it is local, shared, and allows flexibility and collaboration with the private sector. Yet the backlash against centrally executed, experts-know-best practice was so strong that planning had only timidly been exercised in the West during the last three decades. Planners, particularly in the U.S., had largely resigned to being "mere absorbers of public opinion, waiting for consensus to be built" (Krieger 2000: 209), and in this process, lost the capacity of making visionary plans.

It is the sustainability impetus that revived the role of planners in city-building. In fact, urban development in Stockholm had been stagnant since the 1970s, but the decision to build Hammarby Sjöstad in an environmentally innovative way in the late 1990s marked the beginning of an intense city-led redevelopment phase. The success of HS has motivated city planners to proceed with more ambitious large-scale projects, like the new district of Norra Djurgårdsstaden. Similarly in Freiburg, the municipality had not initiated any major development since the housing projects of Weingarten and Landwasser in the 1960s. But during the 1990s, it embarked on two neighborhood developments, Quartier Vauban and Rieselfeld, and also launched a comprehensive energy and land-use strategy.

Certainly, the planning systems of Sweden and Germany are conducive to a proactive role for planning due to the powers they assign to municipalities and the tight regulation of spatial development. Nevertheless, local governments in the U.S. also have powers to shape the urban environment: they can craft comprehensive land-use plans, encourage infill development, identify and protect habitat, propose design guidelines, and promote environmentally proactive policies. But in practice, too few localities engage in formal planning or have growth management policies. It is now urgent that cities embrace planning, and that they do so in a bold, visionary way, setting specific targets for action, as seen in these case studies.

There could be some criticism, especially in the case of HS, about the use of scientific analysis, targets, and indicators that implies a modernistic, rational approach to planning (Healey 1997). Translating sustainable development into technical indicators, rather than concepts of social justice, common interest, and environmental protection, may suffice to achieve technological goals, but does not capture the complexity of its socio-economic aspects.

This is why proactive, visionary planning practice needs to be enhanced with contemporary communicative strategies. Because administrative and legal structures tend to be inflexible and not conducive to innovation, alliance-building and flexibility built into the implementation process are important (Næss 2001). HS brought a realization that targets alone are not enough if not supplemented by horizontal collaboration and the political will to pursue truly sustainable outcomes. Another lesson was learned in QV, where the participation of Forum Vauban in an interdisciplinary group showed that involving future residents, rather than simply technical experts, in the planning process contributed to increased understanding of traits and priorities of development. The QV story also shows that policy conflicts and power struggles do exist; the Forum members often felt they had to "fight" planners to convince them of the validity of their suggestions. However, these conflicts were resolved by mechanisms of mediation that appealed to common goals. The stakeholders, working together over a long period of time, collectively understood the challenges and possibilities and used their knowledge to improve upon future outcomes, consistent with the collaborative planning rationale (Healey 1997).

The examples of Hammarby Sjöstad and Quartier Vauban represent an evolving path within the planning profession that places planners in a dynamic position confronting the challenges of sustainability. Cities desiring to achieve sustainable urbanism can adapt their planning processes in the ways described in this paper. Structural, legal, or cultural factors pertinent to different contexts may mean adjusting the roles

assumed by different entities; this is where alliance-building will prove crucial. For example, in an American city municipal planners could share responsibility for new development with nonprofit organizations, build frameworks that allow them to exercise control over private new development, or set specific conditions to incentivize private development in the desired directions. In essence, planners everywhere need to be more proactive, more visionary, and more collaborative, if they want to bring the principles of sustainable urbanism to bear upon the built environment.

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