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Prairie to Prairie: Ungrowth in American Cities

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Cover Page Footnote

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PRAIRIE TO PRAIRIE: UNGROWTH IN AMERICAN CITIES

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Abstract

The city of St. Louis has suffered tremendous population loss since the 1950s, and is currently a major shrinking city in America. This sustained population loss and its accompanying economic decline has led to many negative effects, including crime, food deserts and property abandonment. Eco-urbanism, which advocates a shift from conventional planning goals of economic and population growth to environmental sustainability and increased quality of life, holds promise for the city of St. Louis, where opportunities for implementing eco-urbanism strategies are more plentiful due to the abundance of vacant land.

This paper examines the current role eco-urbanism plays in St. Louis City through the examination of three eco-urbanism strategies that can be found within the city: community gardens, greenways and urban forests. It reviews the ways in which these strategies have been employed, as well as experienced and possible benefits of these strategies. Social benefits include: increased health, comingling across socioeconomic groups, food security, increased accessibility, and recreation opportunities. Ecological benefits include: increased biodiversity, better water management, decreasing pollution and heat island effect, and the protection and conservation of ecosystems and landscapes. Economic benefits include: development and increased property values. The paper also suggests ways to take the movement further - through adoption of not just its strategies but its ideology by the municipal government, as well as through improving its implementation by having a cohesive strategy, using a flexible approach, and fostering a culture that is enthusiastic towards eco-urbanism.

Introduction

A History of St. Louis as a Shrinking City

Found on the banks of the Mississippi River, St. Louis grew as a result of river barge and railway trade, and the establishment of industries such as brewing, flour, meatpacking, boot and shoe, lead and iron industries (Purdy1901-

1974). This culminated in St. Louis becoming one of the top ten largest cities in the US from 1950-1960, and the fourth largest city in 1870, 1900 and 1910 (US Census Bureau Data 1998a). In 1904, St. Louis was the host of the 1904 World's Fair (Troen & Holt 1977). In 1950, St. Louis reached a peak population of 856,796 (US Census Bureau Data 1998b).

A combination of factors such as economic decline, suburbanization, and white flight led to the decline of St. Louis' population (Gordon 2008). Economic decline occurred as a result of the collapse of the manufacturing industry (Hollander 2011). St. Louis also never fully recovered from the Great Depression and the Prohibition Era, which struck a great blow to the brewing industry and the city (Purdy 1901-1974).

Governmental efforts to reverse this trend came mostly in the form of large-scale urban renewal projects, which ultimately drained the city of resources while doing little to attract new residents (Gordon 2008). Today, St. Louis ranks first in the Top 25 most declining cities in the Northeast and Midwest, 1950-2000 (Hollander 2011). Current St. Louis population as of 2012 is estimated at 318,172, a decline of approximately 63% from its peak (US Census Bureau Data 2010).

The State of St. Louis under Shrinkage

Shrinking cities are *thinner* than they were before, simply because people, the most important constituent, are gone. The population decline leaves an underutilized urban fabric and infrastructure, which, by virtue of being abandoned or blighted, deteriorates and becomes problematic, and even threatens public health. Fire hazards, toxic waste, a proliferation of drug activities, illegal dumping and rodent infestations are some of the problems that arise from abandoned properties (Greenber & Popper 1990). This is evidenced in St. Louis by the countless complaints of weeds, illegal dumping and rodent infestation within vacant lots recorded in the St. Louis Citizens' Service Bureau data (Geo St. Louis).

Crime is also often high in shrinking cities (Hollander 2009). In 2012, the City of St. Louis violent crime rate was 1857 per 100,000 inhabitants, earning it the rank of the second most dangerous city in the USA, after Detroit (Fisher 2012). Although such data may be conflated (Federal Bureau of Investigation 2011) by differences in crime reporting and the exclusion of more peripheral city zones due to the strict city-county divide, this number still remains high. The high crime rate is a result of many factors: the lack of "eyes on the street" (Jacobs 1961), police

budget cuts (Byers 2013; Hunn 2010; Kohler 2009), a high number of abandoned properties (Hollander 2010) and the increasing unemployment rate (Phillips & Land 2012).

Crime feeds into a self-perpetuating cycle, where an increase in crime encourages even more residents, and especially highly educated residents and families with children, to move out of the city. This leaves behind a shrinking population with an increasing makeup of the poor, handicapped, and elderly (Cullen and Levitt 1999), a makeup reflected in St. Louis in US Census Bureau Data (2011). Crime also drives away investment (Skogan 1990).

The cyclical nature of property abandonment (Burchell & Listokin 1981) is fed not only by crime, but a number of other factors. One of them is the housing market. As housing demand decreases with depopulation, this also drives down housing prices (Hollander 2010). In some cases, housing prices can even fall below replacement costs. In such an event, there is then no incentive to maintain and upkeep the property, and the housing stock deteriorate (Mallach 2010), and abandonment takes place (Hollander 2010).

Another factor arises from the appearance of the neighborhood. As physical order is observed in a neighborhood in the form of vacant or dilapidated buildings, unkempt lots, vandalism, litter and other characteristics common to heavily depopulated neighborhoods, the fear of crime increases (Perkins and Taylor 1996). As people are afraid of becoming victims of crime, they are more inclined to move away from the city.

Finally, as depopulation occurs, municipal government budget becomes limited (The PFM Group 2009). This is a problem as it reduces the municipal government's ability to react and respond to problems (Burchell and Listokin 1981), as well as the government's capacity to provide good public services and amenities (Mallach 2010). The shrinking of the budget arises from two factors: a decrease in revenue as the fiscal tax base shrinks, and an increase in spending as maintenance costs increase (National Vacant Properties Campaign 2005).

A decrease in tax revenue is an obvious outcome from a shrinking population size, which affect taxes that are applied per capita. In addition, business tax revenue also decreases as many businesses move or close down as the remaining population base becomes too small to support neighborhood commercial and social activities (Rybczybki & Linneman 1999).

An increase in maintenance costs, however, may run contrary to expectations, since it is surmised that with less people, there is less need to maintain infrastructure. However, it should be noted that while the shrinking of population numbers occur, there is no actual physical shrinkage in the area occupied by the remaining residents. This is because property abandonment is widespread and distributed all over the city, rather than being concentrated

to particular zones. As a result, the remaining occupied area does not shrink, but merely becomes less dense. Infrastructure is then still needed and used by the remaining residents, but at a much lower usage rate. Maintenance costs, however, remains stagnant. In addition, maintenance costs for vacant and abandoned properties factor more heavily into the budget.

Another outcome of this pattern of abandonment is the spatial isolation of the remaining residents. The severity of this problem is especially apparent when considering access to food sources like supermarkets. The USDA Food Access Research Atlas shows an alarming percentage of neighborhoods within St. Louis that are classified as food deserts. 15 out of 106 census tracts are low-income census tracts where a significant number or share of residents is more than 1 mile from the nearest supermarket, and 61 out of 106 are low-income census tracks where a significant number or share of residents is more than 0.5 mile from the nearest supermarket. An alarmingly high correlation exists between those census tracts and tracts where residents have low vehicle access as well.

With many negative effects that play into each other, shrinkage and property abandonment becomes both symptom and cause, leading to a downward spiral of the city.

The Eco-urbanism Movement

Beginning in 1969 with Ian McHarg's book *Design with Nature*, planners, architects and designers have advocated the integration of nature and its principles into the built environment. This has sparked the growth of movements and ideologies such as landscape urbanism (Waldheim 2006), urban agriculture (Andraos& Wood 2010), and sustainable urbanism (Farr 2007).

In 2010, Mohsen Mostafavi, Dean of the Harvard Graduate School of Design, published *Ecological Urbanism*, where he argues not only for the integration of ecological principles into the city but also a more comprehensive approach to reflect the complexity of the urban situation. Integration of other factors, such as the sociopolitical situation of a city, cultural aspects and aesthetic considerations, would also be necessary, as well as more pragmatic issues surrounding the realistic implementation of projects. Both the imperatives of nature and the city are considered.

Eco-urbanism is relevant to all types of cities. However, while currently it is the growing cities that have led the push for green infrastructure, shrinking cities would actually have a greater ease in adopting eco-urbanism due to the abundance of vacant land and the lack of development pressure (Blanco et al. 2009). The study of the implementation of eco-urbanism strategies in shrinking cities was pioneered by Germany, which was studying

various strategies for dealing with the large number of shrinking East Germany cities (Blanco et al. 2009). However, this interest soon spread globally, given the widespread relevance to many countries around the world (Genske & Ruff 2006). In 2002, the project "Shrinking Cities" was launched by the Federal Cultural Foundation of Germany to study the issue on an international scale (Kulturstiftung Des Bundes). In 2004, the Shrinking Cities International Research Network was launched by the Institute of Urban and Regional Development at the University of California, Berkeley, USA (Blanco et al. 2009). Both feature eco-urbanism strategies significantly.

While interest in eco-urbanism has been strongest in Europe, the USA has seen a recent increase in receptiveness towards the movement. Cities like Seattle, Washington, Detroit, Michigan, Buffalo, New York and Youngstown, Ohio have formulated green plans that at once consider their shrinking status and address it using green infrastructure (Blanco et al. 2009). However, in general, uptake of eco-urbanism has been slow.

Eco-Urbanism in St. Louis

Like many municipal governments, the St. Louis City Government has been slow on the uptake of eco-urbanism. This is usually because eco-urbanism, in advocating an acceptance of a city's state of shrinkage, is politically unpopular. Rollin Stanley, Planning Director of St. Louis, even stated, "The dogma of growth is so inherent to cities, that no mayor will address shrinkage...It's stigmatic of failure." (Allweil 2007). As such, the St. Louis municipal government continues to favor policies such as urban renewal that are geared towards promoting conventional growth. While some of these measures, such as the redevelopment of Washington Avenue, have met with success (Mallach 2010), others, such as the St. Louis Centre, have not (Brown 2010).

As mentioned earlier, a shift might be occurring in recent years, as some American city governments are becoming increasingly receptive to the ideas of eco-urbanism. Within St. Louis, certain changes might be seen with the upcoming City of St. Louis Sustainability Plan 2013, which discusses embracing certain eco-urbanism measures such as greenways, parks and community gardens.

In addition, growing interest is also evidenced by two recent competitions that touch on the themes of eco-urbanism: the Pruitt-Igoe Now competition, and the Sustainable Land Lab competition. In 2011, two individuals, Nora Wendl and Michael Allen, set up a non-profit organization Pruitt-Igoe Now in order to sponsor and organize a competition that asked for design ideas for the site of Pruitt-Igoe, an infamous high-rise public housing project that was completely demolished in 1977 (Prost, 2011). Many of the entries integrated eco-urbanism strategies into their proposals, calling for urban forest preservation, urban agriculture, water management, greenway incorporation, park

creation and waste treatment (Pruitt-Igoe Now). In 2012, Washington University in St. Louis, in partnership with the City of St Louis, organized the Sustainable Land Lab Competition, in conjunction with the Sustainable Cities Conference. The project brief called for "innovative projects that transform vacant lots into assets that advance sustainability" (Sustainable Cities Conference).

In part due to the government's reluctance to take up eco-urbanism, and in part due to its lack of resources, many of the eco-urbanism efforts that occur in St. Louis today are implemented through non-profit organizations, community groups and individual efforts. The exception to this is the Great Rivers Greenway District, an organization running on tax revenue from St. Louis City, St. Louis County and St. Charles County, which has been responsible for the construction of greenways that run through the St. Louis metropolitan area, including the city (Krummenacher et al. 2008).

As a result of this informal nature of much of St. Louis' eco-urbanism movement, there is little awareness and formal literature on the subject. This chapter will focus on eco-urbanism strategies that are relatively documented and established within St. Louis: community gardens, greenways and urban forests.

Community Gardens

St. Louis has a large number of community gardens, totaling 158 documented community gardens within the city limits (Gateway Greening). The high number of gardens can be attributed to the work of the non-profit organization, Gateway Greening. This organization has assisted in the startup of many community gardens through grants that provide gardening materials and educational resources, the sharing of knowledge and expertise, seed distribution and tool loan (Gateway Greening). As such, they have become a vital support of the community garden network in St. Louis.

While mainly playing a support role, Gateway Greening has also taken an active role in fostering synergetic relationships between different gardens, as well as between gardens and institutions. The designation of Hub Gardens, a relatively new program, is so as to support nearby community gardens through providing educational workshops and gardening material. These gardens are chosen from existing community gardens based not only on their strategic geographical location, but also for their goals as a garden group, the strength of their leadership, and the group's commitment to the garden as well as to the neighborhood. Gateway Greening has also partnered up with many groups, such as churches, schools and public libraries, to set up community gardens. These institutions provide the land, labor and commitment, while Gateway Greening provides the gardening resources and know-how.

Produce from some gardens are also used in local soup kitchens, grocery co-ops, and local food pantries (Gateway Greening).

The main benefits of community gardens are social. Community gardens provide opportunities for community bonding and therefore increase social cohesion. A study of the users of community gardens within St. Louis showed a high degree of socializing occurring (Glover et al. 2005), across different racial groups (Shinew et al. 2004) and socio-economic groups (Irvine 1999), thereby creating more inclusive communities and instilling a sense of belonging and identity in community members. The presence of community gardens can also serve to increase property values (Voicu & Been 2008; Wachter 2005). This is possibly due to its contribution to neighborhood beautification, which provides a sense of control and perception of stability, which can result in an increase of the market value of vacant properties. Clearing and cleaning of vacant lots can increase adjacent property values by as much as 30%, while planting a tree within 50 feet of a house can increase its value by 9% (Wachter 2005). Finally, community gardens can contribute to crime reduction by providing diversion activity for youths (Ferris et al. 2001).

On an individual level, community gardens have been shown to have positive effects on the health of gardeners, through increasing physical activity (Stein 2008; Dickinson et al. 2003) as well as vegetable and fruit intake (Baker et al. 2006; Alaimo et al. 2008). If produce is channeled to local food distribution sources such as co-ops, food pantries, soup kitchens or stores, it can also increase vegetable and fruit intake of other community members (Blair et al 1991). In addition, community gardens provide food security, which is especially important in areas that are food deserts, and reduce expenditure on food, which is particularly important for low-income families (Hanna & Oh 2000).

Community gardens extend certain ecological benefits as well. Community gardens serve to increase green space within the city (Irvine 1999). Green spaces serve to dramatically reduce urban heat. As much as 60-75% of solar energy can be absorbed by the physiological processes of vegetation, thereby reducing the amount of heat generated from solar radiation (Bernatzky 1982). They can also reduce surface water runoff through increasing water absorption by soil and vegetation (Dunn 2010). They also serve to promote air movement, filter air of pollutants, reduce noise pollution and increase oxygen (Bernatzky 1982). Community gardens may further provide ecological benefits through the reduction of organic wastes, which can be used as fertilizer and compost (Irvine 1999), and promoting biodiversity, for an example through providing nesting sites for bees (Matteson et al. 2008). Finally, community gardens provide great opportunities for environmental education (Bendt 2013).

A problem encountered by community gardens in St. Louis is the need to mobilize enough labor to maintain a garden. An interview conducted by the authors with the Old North St. Louis Restoration Group, for an example, showed that the volunteer labor pool was stretched thin between the five existing community gardens within the neighborhood. Other neighborhoods, such as in the Downtown area, have many residents interested in setting up community gardens but not enough sites with secure land tenure, according to an interview with Gateway Greening.

It should also be noted that there are a significant portion of undocumented community gardens, often started out informally via active community individuals. In many of these cases, the vacant lots used are often not formally owned by the garden operators. As such, the count of community gardens within the city is probably higher than our estimate.

Greenways

Five greenways run through the City of St. Louis: the Confluence Greenway, the Mississippi River Greenway, the River Des Peres Greenway, the Christy Greenway and the St. Vincent's Greenway (currently under construction), and a sixth Greenway, the Choteau Greenway, is currently being planned. All five greenways are or will be constructed by the organization Great Rivers Greenway District, and follow the natural paths of rivers and other waterways (The Great Rivers Greenway District).

The organization defines greenways as such: greenways "are linear natural or landscaped connectors linking parks, trails, residential areas, nature reserves, commercial areas, civic amenities, cultural institutions, and historic sites with each other", "are linear spaces established along natural corridors, such as streams and rivers, or along developed corridors, such as railroad rights-of-way converted for recreational use", and "encourage recreation as well as interaction and provide social, economic and environmental benefits to residents and visitors alike" (The Great Rivers Greenway District 2005).

The Great Rivers Greenway District has identified three outcomes for the greenways: social capital, environmental stewardship, and economic development (The Great Rivers Greenway District 2005). Studies have shown that social capital can be increased via health benefits through encouraging recreation physical activity (Gobster 1995), and via improving accessibility to amenities (Hayward 2011). It may also provide opportunities for co-mingling between racial groups - while studies have shown greenway users to be predominantly white (Furuseth & Altman 1991; Lindsey et al 2001; Coutts & Miles 2011), they have also shown that greenways can act as "green

magnets", bringing people into neighborhoods that may be predominantly composed of a different race, and therefore increasing comingling (Coutts & Miles 2011).

Environmental stewardship can occur via reducing motorized means of transportation through making biking and walking more convenient, filtering air and water pollution, decreasing noise pollution, managing storm water runoff, and buffering riparian corridors (Krummenacher et al. 2008). It can also be used as a means to conserve critical elements of native ecosystems and landscapes, protect watersheds, and increase connectivity between different ecological systems (Hector et al. 2004). At the same time it often provides a safe flood zone buffer, thereby reducing flood damage (Fields 2009). The value of greenways in promoting biodiversity is contested (Bryant 2006). Some studies argue that greenways, in increasing connectivity, will help maintain a healthy biodiversity via increasing animal movement (Collinge 2009; Flink and Searns 1993), acting to buffer surface water and riparian species from urban influences, and also buffer and protect patches of interior habitats (Bryant 2006). Other studies argue that greenways as connecting corridors may actually increase risk for wildlife and act as death traps (Collinge 2009), therefore reducing biodiversity, or may favor edge species while contributing little to the conservation of species that require interior habitats, or may be unsuitable and inappropriate for the native landscape, or may divert resources and concern away from other conservation measures (Bryant 2006).

Economic development can be achieved via greenways through attracting businesses via an increased quality of life. According to Krummenacher et al. (2008), "footloose corporations and high-tech workers seek out high quality-of-life places" and greenways serve to provide the ready access to amenities and recreations these groups seek. Greenways have also been shown to have a strong positive effect on property values (Krummenacher et al. 2008).

Greenways can take on diverse forms and functions, adapting to local needs, values and conditions (Flink and Searns 1993). To categorize them, we can adopt a system used by Searns (1995) in his study of the evolution of greenways. Generation One greenways focus on movement and accessibility, Generation Two greenways promote recreation, with movement and accessibility being focused on non-motorized means instead, and Generation Three greenways incorporate movement and accessibility and recreation with other agendas such as promoting ecological functions or building cultural capital.

Most greenways in St. Louis fall within the category of Generation Three. All five greenways have a wide asphalt trail suitable for street bicycles, as well as pedestrian paths, and St. Vincent's Greenway even incorporates

seven Metrolink stops within its corridor. Many also either incorporate or feature connectors to major streets and destinations. Recreation is facilitated in all greenways through connections to many hiking, biking and walking trails, as well as the provision of amenities such as drinking fountains, rest areas, and even fishing and eagle viewing spots. All of them incorporate major parks into their route, as well as cultural institutions or attractions such as museums, heritage sites and heritage trails. Finally, with the exception of the Mississippi River Greenway, the greenways often incorporate a significant tree corridor, hence providing the buffering and connectivity effects described above, and also list improving water quality as one of their key goals. Many also encourage brownfield development along the greenway (The Great Rivers Greenway District).

St. Vincent's Greenway proposes a particularly interesting case as, unlike most other greenways, it runs through two low-income neighborhoods: Pagedale and Wellston, where more than 39% of residents in the former and 30% in the latter are below poverty line (Krummenacher et al. 2008). Generally, poor and minority groups have less access to greenways, as greenways do not tend to run through neighborhoods with high proportions of these socioeconomic groups (Lindsey et al. 2001). In St. Louis, this is the case because the Great Rivers Greenway District looks to sign a legal maintenance agreement, usually with the local government, before they implement and construct a greenway. Maintenance costs and efforts hence fall under the jurisdiction of local governments. As local governments in poor neighborhoods often lack the resources to maintain such greenways, they are unable to enter such agreements. The St Vincent's Greenway is an exception to the case as the maintenance has been taken on by the civic organization Trailnet, which has agreed to pay maintenance costs for some portions of the Greenway. Parts of the greenway are currently under construction. A very recent study, as of yet unpublished, is currently underway to assess the effects of the St. Vincent Greenway on nearby neighborhoods (Hipp et al. 2012).

Development of future greenways is likely as the Great Rivers Greenway District is rapidly gaining support, and is moving towards completing their River Ring Plan (Hayward 2011).

Urban Forests

To date, the largest and only formal urban forest that exists within St. Louis is the John F. Kennedy Memorial Forest, a section of virgin forest within Forest Park set aside for conservation after the death of President Kennedy (City of St. Louis). This forest is managed by the Forest Park management, under the Department of Parks, Recreation and Forestry, City of St. Louis. An unintentional, unmanaged urban forest has also emerged in another

part of the city: in the old Pruitt-Igoe site. Abandoned for over thirty-five years, dense trees have overtaken most of the site, with a prairie-like landscape also occupying the southwestern portion. (Pruitt Igoe Now).

Urban forests provide a great deal of ecological benefit for the city. As a concentrated and usually large patch of forestation, it provides great shelter for wildlife and therefore greatly increases biodiversity. In John F. Kennedy Memorial Forest, for an example, a study records 106 species of migrant songbirds over 20 spring seasons (Korotev 1999). In addition, these forests often serve as a water catchment area. A small pond has been reported within the Pruitt-Igoe site (Pruitt-Igoe Now), while many small seasonal creeks run through the JFK forest. Naturally, forests also greatly serve to reduce the heat island effect and increase green cover.

Community benefits, however, can be mixed. Urban forests in Germany seem to increase recreation and leisure, as well as add cultural value to a neighborhood (Kowarik & Langer 2005; Dettmar 2005). Similarly, the JFK forest is often seen as a desirable amenity, with users enjoying the increased greenery and activities such as walking, jogging, bicycling and bird watching (Jackson 2011). An additional educational benefit also arises from the JFK forest as rangers often conduct tours and nature walks open to the public to educate them about the forest and prairie ecosystem (Forest Park Forever). On the other hand, the Pruitt-Igoe forest is seen as an eye-sore and a disgrace (The Pruitt-Igoe Myth 2011). A speculation about the difference between these cases and their effects might lie in their degree of maintenance, as well as public perception about whether such a forest was intentional (a result of conservation), or unintentional (a result of neglect).

Discussion

Defining an Urbanism for tomorrow: Nature as an Ideology

Population growth and the manufacturing activities associated with it have historically been the engines that gave vitality to cities. In most recovery plans for shrinking cities, the ultimate goal is to bring people back to the declining areas in order to reverse the situation. However, with problems of overpopulation overwhelming many cities, there has recently been some speculation and re-evaluation of population growth as an ideal (Chamie 2010).

New goals that have surfaced to replace population growth are quality of life and sustainability. This has been particularly evident in mature European cities, where fertility rates well below replacement level have made population growth unrealistic. As mentioned earlier, Germany in particular has been interested in the issue of shrinking cities, in light of many shrinking East Germany cities.

Eco-urbanism holds a particular draw for many cities looking to switch ideals, as, through the integration of nature into the city, it not only increases the quality of life of the remaining residents but also increases environmental sustainability. Eco-urbanism replaces *density* with *intensity*. Growth is accomplished not through an increase in population, but through an increase in the productive capacity of the urban landscape. Hybrids of urban and natural landscapes begin to contribute back to the environment, as the ecology within them helps to mediate problems attributed to conventional cityscape.

St. Louis is unlikely to experience growth, much less overpopulation, in the near future. This makes it even more pertinent to challenge the supremacy of population growth as a planning goal. An additional impetus is the higher likelihood of new goals of sustainability and quality of life finding outlet in a shrinking city like St. Louis, where there is little land use demand and plenty of vacant lots to implement new measures (Mallach 2010). However, as stated earlier, the St. Louis municipal government is reluctant to consider a shift away from population growth as a goal in fear of political backlash.

Even so, such a shift can bring about plenty of tangible benefits to the city. With the acknowledgement of its shrinking status, the city can start "rightsizing" St. Louis' infrastructure in a manner similar to that proposed in a study for Buffalo, New York, and therefore reduce infrastructural maintenance cost (Schilling 2009). In addition, by reducing and concentrating public infrastructure such as schools, the city may be able to increase the quality of its services. Public schools, for an example, will benefit from higher enrolment as students get concentrated into fewer schools, as well as increased funding as the school budget is spread over less schools (Glaeser 2010).

Eco-urbanism may also be particularly poignant in St. Louis, given its geopolitical location in the Bio Belt, region. The Bio Belt comprises of plant and life science enterprises and world class research institutions, engaged in the research, development and production of medicines, agricultural chemicals, organic chemical, medical equipment, among others. These assets are growing in number and give St. Louis a leadership position in the region and in the country (The St. Louis Regional Chamber & Growth Association 2010). As such, the development of ecological research and resources is more likely to inform and be informed by the Bio Belt. Tangible benefits such as funding could also occur. In 2010, The National Alliance for Advanced Biofuels and Bioproducts (NAABB), led by St. Louis County-based Donald Danforth Plant Science Center, received \$44 million from the U.S. Department of Energy (DOE) under the American Recovery and Reinvestment Act to conduct advanced biofuels research to support the development of a clean sustainable transportation sector (St. Louis Bio Belt News 2010). Although

present research is on algae and conducted in controlled labs, in the near future, funds may be diverted to research in other green fuels, which can be grown in vacant city blocks.

An exploration into alternative energy may also benefit St. Louis. Missouri has a high coal usage, and with it, its accompanying problems, which have been often highlighted in recent news (Carson 2013; Tomich 2013a; Tomich 2013b). Its location in the Bio Belt, as mentioned earlier, makes biofuel a plausible option. Currently though, there are no large-scale forays into alternative energy, be it solar energy, wind energy or otherwise. An increased investment in these alternative forms of energy may help alleviate St. Louis' coal dependency.

Reconfiguring the Implementation of Eco-Urbanism

Working small, Thinking Big. Mallach (2010) notes that the inefficiency of the government in its dealings with older distressed cities comes from three factors: absence of a coherent strategy, lack of coordination and a failure to sustain commitment. It is possible that addressing the same issues in St. Louis' implementation of eco-urbanism could help bolster efficiency as well.

Similar to how "cities have scattered billions in investments in new housing, new schools, and public facilities, without weaving them into larger strategies or targeting them to areas with strong assets for future revitalization" (Mallach 2010: 20), eco-urbanism strategies such as community gardens or water management areas, have popped up with little consideration to an overall scheme. This is because, as mentioned above in the section "Eco-urbanism in St. Louis", such strategies mostly happen on the imperative of individuals or small groups and without an organization that comprehensively oversees all strategies while considering the larger context of the city and the region, there is no coherent strategy.

The benefits of a coherent strategy are as such: it allows for an appropriate project to be chosen for implementation in an area where its efficiency will be maximized. It does so by considering how assets or conditions in the neighborhood, city or region can help boost the project, as well as how the project can in return help strengthen the neighborhood, city or region. In fostering such synergetic relationships between different projects, and between projects and the city, a coherent strategy can increase effectiveness while minimizing resource use. This is especially important in a cash-strapped city like St. Louis, where resources are limited and should be well-spent. Similarly, having an overseer will also reduce lack of coordination and thus streamline resource use. Increasing coordination could even help increase resources, through sharing, inter-institution donation or exchange and increasing knowledge about funding opportunities.

However, a word of caution should be given against rigid master plans. Cities exist in a perpetual state of dynamic flux. It is difficult to predict how a city will grow or, in this context, un-grow. It is this unpredictability and constant change that causes any master plan, the historically conventional tool of the city planner, to be an obsolete method of planning. What would be more pertinent, and ultimately more realistic, is a flexible proposal that contemplates multiple scenarios based on the availability of space, resources and adequate uses for productive activities, while at the same time leaving room for flexible uses and change (Neuman 1998). We simply cannot rely on restrictive formal design strategies.

It is even more difficult to predict whether a certain reactivation strategy will work on a determined city. Allocating resources to implement such plans becomes risky and unattractive. Hence, a plan should be implemented as a series of short-term synergetic strategies with a long-term comprehensive vision, which arises from an accumulation of small-scale and short-term ideas over a long period of time. Moreover, using a small scale for the project decreases the risks at the neighborhood scale while minimizing the impact of failure at the city scale. In this way, such a plan simultaneously caters for the specific needs of each site, while considering the city as holistic armature.

Ideally, the overseer for such a plan would be the municipal government; they would possess a comprehensive outlook on the city, as well as a balanced range of interests. The municipal government has already demonstrated interest in creating a comprehensive, flexible plan through its publication of the City of St. Louis Sustainability Plan 2013. Unfortunately, this plan and current governmental involvement in general, continues to be limited by its adherence to the conventional planning goal of population growth. Within St. Louis, there are additional barriers in terms of the local policy environment, where a large number of fragmented local governments are reluctant to relinquish local control and residents are highly mistrustful of government regulation (Krummenacher et al. 2008).

Given these obstacles and the strong role that non-profit organizations currently play within the St. Louis eco-urbanism movement, a combined board of relevant stakeholders may also be a viable option. Currently, both Gateway Greening and the Great rivers greenway already play the role of coordinator within the implementation of their respective strategies of community gardens and greenways. In doing so, they have managed to set up some synergies - for an example through the setting up of Hub Gardens by Gateway Greening (Gateway Greening). However, their roles are currently limited by their specific scopes of interests, which is not as conducive for inter-strategy crossovers, as well as their operation models. Gateway Greening, in operating as a support organization

rather than an overseeing organization, has little to no say as to where a community garden should be sited, or even if it should be implemented.

For now, an interim measure would be for designers, community leaders and individuals to consider possible synergies between their projects and other projects or other institutions of the city. Even without a plan, encouraging such synergies would help develop a network that could bolster both the eco-urbanism strategies and the city.

Success in the Face of Failure. Addressing Mallach's last problem, the failure to sustain commitment, is difficult given the nature of St. Louis' eco-urbanism movement. As many strategies are currently carried out in a piecemeal manner by many different groups, of whom a significant portion are individuals or small community groups with limited agency, long-term commitment can seldom be guaranteed. Certain problems, for an example the death of an individual who was particularly active within the community, or the lack of funds for a church group running a community garden, are simply out of anyone's control. Eco-urbanism projects in the St. Louis context are likely to keep coming and going.

A possible way to address this is to adopt a different model: one that allows for the failure of individual projects while focusing on the overall growth of the eco-urbanism movement. To accomplish this, a flexible, adaptable and versatile working methodology should be applied. A current methodology being tested and employed by the authors is to develop a palette of possible programs, then pick an appropriate strategy from the palette based on a conducted quantitative research to assess a given community's desires and needs, and finally implement the chosen program in a way that will enrich future eco-urbanism project implementations, even in the event of the failure of that particular project. In the first step, the palette, which contemplates a range of possibilities that can be grouped into two main categories: productive landscapes and leisure/recreational areas, provides flexibility as well as some form of replicability and therefore ease of implementation. Productive landscapes include uses such as agricultural production, energy production and environmental remediation, while leisure/recreational areas would address community wellness. The second step minimizes failure by making sure the community is able to and has the incentive to support the project. Once the proposal is implemented, the situation evolves and an assessment of the results can be performed. The last step can be carried out through educational opportunities arising from the implementation and operation of the project, as well as documentation of the process and outcome to serve as a resource. Areas that may not adapt to new interventions can be left untouched, and if planned appropriately, they can remain dormant until re-activation is needed.

Through focusing on enabling the movement rather than individual projects, the failure of the latter is seen not only as possible but even a necessary step in the adaptation of a process geared towards evolution. Each new project will then be building upon the legacy of the old projects.

Perpetuating an Eco-urbanism Culture through Education. Given the transient nature of projects, what is important then is to enable the continuing implementation of eco-urbanism. One way to do so is to ensure a culture that is willing to invest time, effort and money in eco-urbanism strategies. Through opportunities arising in the implementation and operation of current eco-urbanism projects, we can educate people on the benefits and importance of such strategies. Public participation will be key to the success of future projects and the perpetuation of a culture geared towards eco-urbanism (Faga 2006).

The 24,000 vacant lots in St. Louis pose both a problem and an opportunity, but above all, they are a symptom of the inadequate capacity of the authorities and residents of St. Louis to productively utilize those lots. While St. Louis residents are certainly not below par in terms of their capability, the sheer number of vacant lots simply overwhelms the total capacity of all residents. One solution to this problem is to increase the capacity of the existing local residents. Another solution is to import additional capacity. A two-pronged approach that accomplishes both of these goals in a broad and replicable way has great potential to positively remediate the situation.

In order to import additional capacity, especially for-profit businesses, to productively utilize vacant lots, a helpful strategy is to minimize the risk associated with locating a business in the area. One way to do this is by conducting market research to identify existing wants or needs in the community and to gauge the support of the community for a business. Creating a thorough and highly visible market study in the St. Louis neighborhoods will serve as both a welcome sign and guidance tool for outside businesses.

A successful approach to increasing the capacity of the local residents focuses on human capital (i.e. individuals' health, education, motivation, etc.), as well as social capital (i.e. partnerships, human relationships, and co-operation). Human capital is strengthened as local residents are educated and trained on various subjects in the process of realizing the projects. This will equip the community with skills to transform other vacant lots.

As cities shrink, the remaining population becomes poorer, losing basic skills and ultimately losing hope. Interventions can serve as opportunities to educate and train local residents through workshops offered in situ, to specialize in new ways of employment or self-employment.

Conclusion

The shrinking city is not an anomaly, but rather an endemic condition of American cities, an integral stage in a natural process. St. Louis began as a prairie settlement and grew through stages of farms, factories, and the devouring of agricultural land through suburbanization. Its post-industrial landscape became one of eroding density and obsolete infrastructures. Now, the absent natural terrain has reasserted itself in voids dotting the urban fabric. Untouched, these voids return to their dormant ecologies and offer opportunities for community regeneration and sustainable urbanism.

This cycle presents an opportunity to remake St. Louis into the model of a healthy city of the future, providing a better environment for its existing and future residents. Therefore, proposals of un-growth should contemplate refraining from building and thereby not driving away current residents with yet another construction site. Rather, it should aim to activate existing open areas with productive landscapes in a broader sense, and thus establish St. Louis as a sustainable, equitable and economically self-sufficient city.

It is key to capitalize on the existing population and enable residents to take control of and build on community assets. We should focus on revitalization projects and enhancing the quality of life in neighborhoods.

Shrinking cities can fix the damage produced by urban sprawl. The restoration of urban ecosystem is based on harnessing the resource of the land. Therefore, we should view vacant properties as desirable circumstances to increase biodiversity, restore natural system, lower carbon emission, produce energy, collect, treat and distribute water, eradicate hunger, promote local business and improve public health.

As the community grows around “green hubs,” the stage will be set for future sustainable development. Available land will become a link into the photosynthetic, agricultural and food strategy of this productive chain. The process calls for a multidisciplinary approach that will engage the existing Bio Belt community into an urban strategy. This initiative is based on the integration of the environmental, territorial, social, productive, technological, philosophical and political in a proposal valued for its sense of bettering human development at the urban scale. The productive process requires phases that will extend over the next century. The new eco-urbanism starts to emerge, stabilizing and possibly increasing the current population density. A new cycle of urban appeal begins.

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