

From Brown to Green: Opportunities for Sustainable Brownfield Development in East Tampa

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Introduction

This volume of papers is the end product of eight students' work in the Environmental Science and Policy Capstone Seminar at USF in the Fall of 2008. The course provided opportunity for students to apply their theoretical knowledge in a real-world setting. They were challenged to develop potential projects and ideas around the theme of brownfields redevelopment while taking into account issues of the new sustainability movement and the particular health concerns present in the community. Most of the students were either near the end of their master's programs or within the first year or two of their Ph.D. studies. Thus, they came to the class with a range of experiences and skills. While in the class, students read and discussed a series of essays within a textbook called the *Sustainable Urban Development Reader* and gained knowledge from the book *Ecocities*, by California visionary Richard Register.

Students toured East Tampa with Lorna Alston, an Economic Development Specialist with the City of Tampa's East Tampa Development Department, and they took part in a community listening session organized by the East Tampa Development Department, Tampa Bay Engineering, and USF. The purpose of the tour was to acquaint students with the character of East Tampa and to show them some of the brownfield sites that have been redeveloped and some that have not been redeveloped. The listening session focused on gauging the public's concerns about brownfields from a health and environmental perspective. At this event, students interacted with key community leaders and listened to their concerns about their neighborhood. I am grateful for the participation of all who assisted the students in their work.

These papers represent a series of interesting approaches to brownfields redevelopment. The first four papers focus on brownfields redevelopment, job creation, and sustainable water and energy production. The second set of four papers focus on community health and diet, the

development of a greenway, surface water in the region, and public art. Together, they provide the community with many options for brownfield redevelopment within a sustainability framework. The papers were asked to provide these short papers as part of their overall class assignment and we hope that they are of use to the East Tampa community in the future.

The new sustainability movement has grown out of a combination of events including greater awareness of the causes of global warming, the growth of environmental benchmarking (such as the Florida Green Building Coalition's Green Local Governments program), the worldwide economic decline, and greater concern about the environment. The new sustainability is very much informed by the environmental justice movement. As we become focused on finding new ways to manage our personal lives, our businesses, our governments, and our communities in this era of change, it is likely that new green jobs, new industries, and new funding programs will emerge in the next decade. Communities such as East Tampa can benefit from these trends by evaluating and prioritizing ways in which the community can move forward in the coming years. These papers provide some suggestions for the future.

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**Green Building on Brownfields:
Creating a green education and health center on a
brownfield in East Tampa**

by
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Abstract

Sustainable development is no longer simply about protecting the environment; it is now also about protecting people's health, culture, and livelihoods (Gladwin et al., 1995). Redeveloping brownfield sites addresses all three of these sustainable development goals. Constructing a green building on a remediated brownfield site can address sustainable development goals even better (Wedding & Crawford-Brown, 2007). There are inherent synergies between green building and brownfields as well, including funding opportunities and improved potential for Leadership in Energy and Environmental Design (LEED) accreditation, a third party green building accreditation system created by the United States Green Building Council. In addition, both green building and redeveloping brownfields provide for reduced psychological stress within the community and greater property values (Kaufman & Cloutier, 2006). In order to take advantage of these synergies, East Tampa should redevelop one of its brownfields into a green education and health center. This would provide jobs and job training to the community as well as improving health. At the same time, this landmark project could be used to spark additional projects along the same vein. Ultimately, the building should become a source of pride within the community.

Introduction

For many years, both academics and developers linked the concept of sustainable development almost exclusively with the improvement of ecological sustainability. More recently, the framework of sustainable development has included to additional components to create a tripod on which sustainable development rests: ecological sustainability, social

sustainability, and economic sustainability (Petter, 1995; Gladwin et al., 1995). Thus, not only must we be concerned with preserving the natural environment through sustainable development, we must also be actively engaged in preserving the character of individual communities and protecting the livelihoods of the residents in those communities (Petter, 1995). This requires assuring residents that the development has the potential to bring in jobs and improve their health while not dramatically increasing their cost of living.

To support these three components of sustainable development, researchers have defined four pillars: democratization, humanization, vitalization, and communalization (Gladwin et al., 1995). These pillars are basically principles that must be supported in order to achieve sustainable development; ultimately, they indicate the need for equal voice, equal opportunity, and community involvement in particular. Everyone in the community should be given a voice, the chance to guide the community's development, and a stake in the community's future.

East Tampa is in the midst of a tremendous opportunity to engage in all aspects of sustainable development, with an active and educated community base, wider support from the city government, and a dedicated team working to implement sustainable development projects within the area.

The brownfields in East Tampa represent opportunities to implement sustainable development strategies. These brownfields are lands that have become blights on the community, whether through contamination or perceived contamination, but they can be redefined as an opportunity to redevelop areas in the community using sustainable techniques that will support the health and well being of both the environment and the residents. Developing brownfield sites can provide additional open public spaces to the community, provide sustainable employment for community members, and improve overall community health while reducing infrastructure and energy requirements (Kaufman & Cloutier, 2006; Wedding & Crawford-Brown, 2007).

Building green on brownfield sites creates an opportunity to further the sustainable economic, social, and environmental development in East Tampa. Research has demonstrated that implementing green building strategies on brownfield sites can provide additional benefit to the community through improved property values and public perception (Kaufman & Cloutier, 2006; Wedding & Crawford-Brown, 2007).. A multi-use pilot green building project on a brownfield site has the potential to serve as a visible symbol for the neighborhood in addition to providing health services and job training for its residents.

The Proposed Project

East Tampa should initiate a green building pilot project to provide an example and focal point for future redevelopment efforts as well as providing immediate benefits to the community. Optimally, this building would become LEED certified to give it maximum visibility and potential for public relations.

The green building project would include components from similar designs that developers have undertaken during multiple brownfield redevelopment pilot projects (Kua & Lee, 2002; Environmental Protection Agency [EPA]; 2002). These projects aim to combine the sustainability benefits of redeveloping brownfields with the benefits of green building technologies, converting a site with negative health, economic, and environmental impacts into a site that benefits the community (Kua & Lee, 2002; EPA; 2002).

Specifically, this project would serve multiple functions within the community. It would serve as a green jobs training center, providing skills so that members of the community could obtain “green collar” jobs. These are jobs related to the environmental field such as installing solar panels, performing energy audits, and trimming trees. In addition, the building would rent

out space to be used by businesses in the health sector. The project would provide a model for a green, urban education and health park; future projects could further that initiative.

The green health park model could support multiple sustainable goals within East Tampa. It would encourage health providers to locate within the region, improving access for residents, and it would provide job training and job opportunities to local residents within the community, reducing travel time and travel expenses. In the South Bronx, a hands-on green jobs training program is providing quality jobs to the local population, with 85% of graduates placed in jobs (Sustainable South Bronx, 2008). The potential East Tampa green building project provides a similar opportunity for training, using the building itself for demonstrations. In addition, developing a green health park in a high density setting will improve energy efficiency, reduce pollution, and provide access to health facilities. Perhaps most importantly, this type of demonstration project is an effective way to engage local stakeholders for the long-term (Kua & Lee, 2002).

Recommended Green Design Elements

The recommended green design elements will consider three independent characteristics. First, they will consider the potential to achieve credit for points from the United States Green Building Council toward LEED certification. Second, they will consider the local conditions in Florida, and what design characteristics should be included based on local climate and culture. Third, consideration will be given toward visibility and cost-effectiveness of certain strategies. While it is beyond the scope of this paper, consideration should be given to the necessity of developing a comprehensive, holistic approach to site development from the outset, so that all necessary stakeholders are involved in each phase of the project (Thabrew et al., 2009). Where

possible, the community should receive updates on the project's progress (McCarthy, 2002). The process, in other words, should be transparent and inclusive (Eiser et al., 2007). This has been found to increase support for brownfields redevelopment projects in other areas (McCarthy, 2002; Thabrew et al., 2009; Eiser et al., 2007).

Part of the advantage of building on a brownfield site is the potential to earn a number of "automatic" credits toward LEED certification (Edwards et al., 2008). One point is earned for developing an appropriate site and another for redeveloping a brownfield. In addition, points will likely be achieved for development density and transportation access. Moreover, brownfield redevelopment projects are likely to receive up to four points for innovative design strategies if well-integrated planning is performed. If it received all of these points, a brownfield redevelopment project would receive 8 out of the 26 points necessary for the basic LEED certification.

Other LEED credits are related to issues important to the climate in Florida. First, reducing the heat island effect is important in climates similar to that of Florida (Nyuk Hien et al., 2007). This means reducing the exposed pavement and rooftop surfaces that trap heat (Nyuk Hien et al., 2007). Two points can be achieved through LEED for reducing this effect. In addition, water resources are very important in Florida, and in East Tampa in particular. LEED provides two credits for wastewater management, two credits for providing proper ground cover, and two credits for water management strategies. Energy is also an important consideration, and LEED gives up to ten points for energy conservation measures. One potential system that could be cost effective and assist in obtaining credits is a geothermal cooling system. This type of system takes advantage of naturally stable temperatures beneath the ground to heat and cool a building. Designing a well-insulated building envelope is also important for improving energy efficiency (Oktay, 2002).

Many cost effective measures overlap with the strategies discussed in the previous paragraph. For instance, using green insulation and properly installing it can help reduce heating and cooling bills without significantly adding to the overall cost (Oktay, 2002). In addition, water management strategies can generally be implemented for a moderate increase in price (Katz, 2003). Over their lifetimes, geothermal systems can be less expensive than traditional air-conditioning units, although the upfront cost is greater (Katz, 2003).

Most of the strategies that could earn LEED credit also make for good hands-on educational elements. A green roof can assist with water management while also teaching gardening, pruning, and green-roof installation skills. If the project chooses to use on-site renewable energy, that would provide the potential for installation and maintenance training (Kua & Lee, 2002). The energy efficiency improvements could be used to train energy auditors, while leftover green insulation could be used to train installers.

LEED also provides credit for using local and recycled materials; however, this could be taken one step further. Residents within the community could provide a portion of the labor for the project, and electricians, plumbers, and developers within the neighborhood could be contracted to develop the site. This approach provides local jobs and increases the economic sustainability of the project.

This is not a comprehensive list of all the LEED credits that could be achieved; it is simply an outline of a few recommended credits based on case studies in Cyprus, Jordan, Maryland, Illinois, and Sri Lanka (Oktay, 2002; Ali & Al Nsairat, 2008; EPA, 2002; United States Green Building Council [USGBC], 2008; Emmanuel, 2005). Other credits should be evaluated with architects, developers, and local stakeholders (Eiser et al., 2007).

Costs and Benefits of Green Building

While green building has a reputation for requiring significant additional costs, recent studies have shown that the costs have come down to manageable levels as architects and developers have become more familiar with the process.

Green buildings currently have a cost premium of 2% above a comparable non-green building on average (Katz, 2003). However, grants can partially mitigate these additional costs, and costs are also reduced for the lower certification levels. Indeed, for the basic certification, the cost premium average is approximately 0.66% (Katz, 2003). A development team can reduce this to essentially zero by incorporating green building design from the beginning of the design and development process.

On the other hand, there are significant benefits to green buildings. First, green buildings are, on average, 25-30% more energy efficient than standard buildings, depending on certification level (Katz, 2003). Second, they provide improved indoor environmental quality. This has a direct impact on the health of the people who use the building. Buildings generally have as much as ten times the concentration of pollutant compared to outdoor air. By eliminating indoor sources of these pollutants and properly locating ventilation, green buildings can reduce the levels of these pollutants. Providing individual temperature controls, lighting controls, and windows can improve worker productivity up to 10% (Katz, 2003). Moreover, workers prefer working in green buildings when given the option (Katz, 2003). Some studies have found that the gains from improved health and productivity outweigh those of energy savings (Katz, 2003; General Services Administration [GSA], 2008).

A separate General Services Administration (GSA) study of 12 projects determined that green buildings had 13% lower maintenance costs than comparable traditional buildings (2008).

As the landlord for the federal government, the GSA has experience analyzing building performance and a great deal of power to determine whether green building practices become commonplace. According to the GSA, savings from green building measures resulted in costs of about \$2.88 per square foot as opposed to \$3.30 per square foot. In addition, building users were 27% more satisfied in the green buildings compared to the national average (GSA, 2008). These are preliminary findings, but indicate that there are marked advantages to building green.

Overall, considering a reasonable timeframe of twenty years, a green building could provide a benefit of greater than \$50 per square foot, far outweighing the additional costs of \$3 per square foot or less (Katz, 2003). This is before even considering psychological effects such as occupant and worker satisfaction, which are more difficult to quantify. In addition, these numbers use conservative productivity estimates. Even before examining the potential for alternative funding sources, the benefits of using green building strategies when developing brownfields outweigh the costs.

Potential Funding Sources

One of the advantages of building green on a brownfield site is the potential to utilize funding opportunities related to both initiatives. This can help offset some of the costs related to remediating a brownfield as well as partially offsetting the upfront costs related to green building design and construction. Ongoing maintenance and utility costs will be lower due to the green building strategies and will be covered by rent.

The Smart Growth Implementation Assistance Program is designed to provide communities with technical assistance so they are better able to implement smart growth strategies (EPA, 2006). This program is administered by the EPA and does not provide grant

funding. Instead, the EPA provides a team of contractors to perform a site assessment and provide recommendations (EPA, 2006).

The EPA has recently provided \$500,000 for *Brownfields Sustainability Pilots*. While the EPA has already allocated this money, similar funding will likely be available in the future (Edwards et al., 2008).

Green Building Supplemental Environmental Projects provide funding from private sector entities that must provide money for environmentally beneficial projects as part of a settlement in a civil action suit (Edwards et al., 2008).

There are also additional opportunities for funding through the Solar and Geothermal Tax Credit, as well as through the EPA and DOE (EPA, 2006; Tansel et al., 1999).

Examples from Other Projects

In order to further define potential strategies and funding sources for converting a brownfield site to a green education and health complex, comparable projects were examined. These projects were considered for similarities in project type, scope, climate, and location. Since this is a relatively new type of project, some leeway was given in the categories if the project provided valuable information in at least one area.

Carkeek Park Environmental Learning Center – Seattle

The Carkeek Park Environmental Learning Center was a 900 square foot LEED Gold educational building built in Carkeek Park, under the control of the Department of Parks and Recreation (Cohen et al., 2004). The total project cost was \$767,948, with a 7% cost premium associated with LEED construction and documentation (Cohen et al., 2004). However, more than

half of this increase was associated with soft costs, meaning the paperwork and documentation. Many of these costs can be avoided by working from the outset with an experienced green builder. This project's ongoing operation is funded in part by 11 separate sources, including the Seattle Department of Parks and Recreation, King County, public utilities, private enterprises, and nonprofits (Cohen et al., 2004). It provides free educational programs related to environmental issues for the community.

Montgomery Park Business Center – Baltimore

Although at 26 acres this site is larger than a proposed project in East Tampa, it is useful for considering the potential to lure businesses through green building on brownfield sites. The building is currently 40% occupied (540,000 square feet), with 1500 workers, and the developer expects that when it reaches full occupancy it will provide employment for between 3,500 and 5,000 individuals (Northeast-Midwest Institute). The project obtained funding from a number of sources, including federal funds from the HUD Section 108 program, brownfield incentive program funding, and Community Reinvestment Act credits (Northeast-Midwest Institute, n.d.). Among its green features are gray water reuse, low energy heating and cooling systems, and a green roof. This project's development is an important psychological boon for the community, and 25% of the created jobs are expected to be entry level, with the remainder providing opportunities for members of the community with higher-level skill sets (Northeast-Midwest Institute, n.d.).

Community Center Building – Springfield

This is a 1.2 acre community center seeking LEED certification (EPA, 2002). It is planned by a nonprofit, the New North Citizen's Council, and will be located on a brownfield in an area with a

population that has high asthma rates. The developer is constructing it with the assistance of the EPA through the EPA's Green Building on Brownfields pilot programs (EPA, 2002). Through the program, the project receives up to \$15,000 in consulting services (EPA, 2002).

Chicago Center for Green Technology – Chicago

This was an urban brownfield revitalization project. The building received a LEED platinum rating and included strategies such as a geothermal heat exchange system, a green roof, rainwater collection, and solar panels (USGBC, 2008). The building is occupied by organizations working on conservation and renewable energy in both the private and public sectors, and also includes an educational space (USGBC, 2008). Its ongoing costs are paid through rent.

Conclusion

Redeveloping a brownfield into a green education and health center will provide multiple benefits to the community of East Tampa and the city of Tampa as a whole. This type of project incorporates all three elements of sustainable development: social, environmental, and economic. It will provide jobs and job training to members of the community, while also improving community health and increasing property values. In addition, the psychological benefits of replacing a brownfield with a healthy, efficient building will be great. Moreover, this project can serve as a demonstration building to increase people's awareness of environmental issues while at the same time demonstrating that the community of East Tampa is at the forefront of this movement.

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The Viability of Renewable Energy Technologies in East Tampa

by
Joshua F. Berger

Introduction

Implementation of renewable energy sources will be crucial in the 21st century, yet its usage is still often limited. Factors such as global warming, energy independence and costs are driving the current popularity of new forms of clean energy which can substitute reliance on excessive fossil fuel consumption. It is imperative for the United States to integrate clean energy technologies where ever feasible. Brownfield's provide a unique opportunity of fostering clean energy development because they are existing unused or abandoned properties within most cities which can be converted to a worthwhile component of any urban area, given the right resources, funding, and leadership are available. The focus of this research will be on renewable energy strategies, utilizing solar, wind, and geothermal technologies that can be applied to Brownfield redevelopment projects in East Tampa. Further, guidelines to sustainable energy policy will be offered so that the community of East Tampa can maintain an energy vision in which to adhere by. Lastly, this research will provide exposure to green job opportunities for the citizens of East Tampa to take advantage of, if they so choose.

Solar Energy

Solar energy is derived from the energy produced by the Sun that reaches the Earth. Solar electricity may be defined as the result of a process by which directed collected solar energy is converted to electricity through the use of a heat to electricity conversion device (Mills 2004). As a substitute for traditional sources of electricity, solar energy is mainly used for heating water and spaces inside building infrastructure (EIA 2007). Solar technology can be deployed through the large-scale development of solar power plants and through the utilization

of photovoltaic (PV) apparatus's, which tend to be mobile. Solar energy is an advantageous renewable energy source because it is non-polluting, silent, clean, and relatively constant, in that, sunlight can be collected on most of the time (Clarke 2008). However, solar energy cannot be collected at night time and its perceived capital cost is arguably the strongest barrier for further entry into energy markets (SEA 2007).

Brightfields (Powerplants)

Brightfields are solar array infrastructures which are built on Brownfield sites. This type of renewable energy concept can include a solar energy manufacturing plant, building-integrated solar energy systems, or solar electrical system placed directly on top of a Brownfield site (DOE Bright 2008). The establishment of Brightfields in East Tampa can immediately improve energy efficiency, whereas continued reliance on utilities to provide energy can be expensive and increase the environmental footprint of the region in terms of emissions. Also, Brightfields can possibly encourage job growth through the creation of new jobs that specialize in the fabrication of silicon wafers for innovative types of solar panels, a niche that presently remains unfulfilled in the Florida market. Brightfields could also set East Tampa as a role model in environmental and energy design. As a result, other communities could turn to the community of East Tampa for inspiration and support in 'green' matters.

Currently, Brightfields are a relatively new type of sustainable design. Only two areas in the country have embraced Brightfields as a means of converting old, dilapidated brownfield sites. The first local Brightfield program was developed in Chicago, in 1998, and included a number of public and private partners working together to develop a solar photovoltaic (PV) manufacturing plant, several roof-mounted PV systems, a ground-mounted PV array, and educational programs (Ribeiro 2007). Another interesting Brightfield case study can be found in

Brockton, Massachusetts (Figure 1), where a once-polluted industrial site was converted after laying stagnant for over 40 years (Johnson 2006). The project in Brockton was designed as a solar energy park, with attractive fencing and landscaping, and a paved educational plaza at the entrance (Ribeiro 2007).



Figure 1. These images depict the Brightfield solar power plant in Brockton, Massachusetts. Source: Waste News; 29NOV08.

The Department of Energy (DOE) estimates that the market for PV systems built on brownfield property in the US is robust. In fact, DOE (2008) suggests that the 5 million acres of abandoned industrial sites in United States (US) cities could supply 90% of the country's current electricity demand (DOE 2008). However, gaining sufficient funding for any type of Brightfield Initiative could provide difficult because it is a relatively new type of venture. Only \$379,800 was awarded nationwide through two solicitations in 2000 and 2004 with a total of six grants made (Ribeiro 2007). Currently, funding is not specifically offered for Brightfield development directly. However, funding for general solar development projects can be found, and differ depending on if the planned facility is city-owned or privately-owned. For instance, if city-owned, East Tampa could apply for Clean Renewable Energy Bonds and possibly a Renewable Energy Production Incentive. On the other hand, if privately-owned, the owner may qualify for the federal investment tax credit (Ribeiro 2008). Finally, through the Renewable Energy Production Tax Credit, East Tampa could save \$0.01/kWh for electricity produced from for this type of solar venture project (DSIRE 2007).

Currently, DOE agency officials are collaborating in select states with local governments and industry stakeholders under the Brightfields Initiative as a result of the success in Chicago (EPA 2008). The Chicago Brightfield experience has been a success. The converted Brownfield has attracted Spire Corporation, a solar panel manufacturer, which led to the creation of 100 new jobs. Also, the introduction of a Brightfield in a community can be a catalyst for further renewable energy integration. The city of Chicago formed an alliance with the local energy utility to continually adopt solar power as a result of their Brightfield experience (EPA 2008). Most likely, partnerships will have to be established with the City of Tampa and other stakeholders to promulgate a Brightfield Initiative. By examining the Brightfield success stories of Brockton, MA and Chicago, Ill, East Tampa could capitalize on a unique revitalization opportunity which incorporates economic development, environmental protection, and sustainability.

Photovoltaic (PV)

Global and regional demand has been increasing in recent years for solar technology and therefore the prices for components and silicon have increased as well (Arnoldy 2006). Standard solar panels are assembled from arrays of photovoltaic cells derived mainly from silicon which is similar to a computer chip semiconductor (Econ 2008). PV solar technology tends to be more mobile, and therefore, has the potential to be arranged in various designs. Silicon is the most popular material for PV devices, but it can be derived of other materials such as polycrystalline or single-crystalline as well. The most important part of a PV solar cell is the semiconductors layers, because this is where the electric current is created (DOE 2005). For the East Tampa Brownfield initiative, PV technology has great potential due to ideal climatic conditions within

Florida for capturing solar energy, and the capability of the technology that can be retrofitted in the urban environment.

It is generally recognized that PV in buildings has the potential to become a major source of renewable energy in the urban environment because of its versatility (Tian et al. 2007). However, the actual output of PV system technology in an urban environment can differentiate depending on region employed. Factors such as orientation, total irradiance, spectral irradiance, wind speed, air temperature, soiling, and various system-related losses can affect solar output (Luque 2003). In the urban environment, the loss of sunlight from obstructions is a potential system-related heat loss, but this should not be an issue in East Tampa because of the relatively low lying structures (Littlefair 2001).

Overall, solar technology has experienced immense development within the past 20 years. Over the next few years, thin-film technology should become viable in the urban arena. The major material cost component is usually the glass sheet onto which the film is deposited (Green 2004). However, because thin-film technology (figure 2) uses less materials, they are generally cheaper to produce, not least because they can be deposited on bases like metal, glass, and plastic (Econ 2008). One popular technique currently in the research and development phase is structuring the most-effective PV material, copper indium gallium selenide (CIGS) onto glass tubes which can collect solar energy more effectively than other methods (Econ 2008). As technology progresses over time, the expectation is that PV solar mechanisms will become more cost-effective. Until then, East Tampa stakeholders could take advantage of the Million Solar Roofs Initiative, offered by DOE, which can provide funding and assistance for establishing area-specific solar technology.



Figure 2. Thin film solar PV technology for residential developments. Source: Sustainable Energy; 29NOV08

Passive Solar

Passive solar design techniques integrate a combination of building features to reduce or even eliminate the need for mechanical cooling or heating and daytime artificial lighting (DOE 2000). In effect, designers position new structures in such a manner so that natural light from the sun can infiltrate the windows of a living space of a structure more effectively, thereby decreasing electricity costs. By understanding the solar inclinations and patterns of a particular area, more sunlight is able to enter. In East Tampa, this method could be implemented on either future developed structures or structures that will be re-modeled, such as the public housing units.

Wind Energy

Wind energy is natural and the only barrier to consistent power generation is the unpredictability of meteorological patterns. Thus, wind power is most compatible in world

regions known for a constant energy flux of medium-to-high intensity winds. In the real-world environment, the wind is supplied directly from the sun, and the physical contours and elevation of Earth have a direct affect on the speed and flow of the breezes (DOE 2006). Wind energy is expected to play an increasingly important role in the future national energy scene (Ezio 1988 and Fung 1981). Planning where to situate large wind farms can be quite controversial, considering unforeseen environmental impacts, public disturbance, and initial cost requirements used to design a wind farm. Wind energy is versatile, meaning many variations and designs exist depending on the needs of the user and the area-specific climatic conditions.

Currently, the state of Florida is not an ideal location to employ large land wind farms due to a marginal amount of consistent wind. However, some potential exists for small wind turbines (less than 100kW) as well as micro sized wind turbines (less than 5kW) for residential, commercial, or Brownfield sites in East Tampa. Presently, more people are turning to small wind turbines as a means to implement an innovative green building technology into their homes. Turbines selection is based upon the pre-existing energy requirements of the structure in question. The owner has the choice of measuring the energy requirements over time by recording the electricity meter or hiring professional assistance. The actual space required for a micro or wind turbine can be small or large; ranging from one square yard upwards to ½ acre, depending on how much power is needed (Ravindranath 2002).

A micro wind turbine (figure 3) can be one of the most promising technological solutions for producing electricity in residential or Brownfield applications for consumers in urban areas (Celik et al. 2007). Strong potential exists to significantly reduce the amount of energy lost (typically two-thirds) in traditional grid distribution (Rankine et al. 2006). As a result, less of an impact is deposited on the environment. Similar to solar units, wind turbines tend to have a higher capital cost, but can pay for themselves in the long run. Grant funds for wind energy



Figure 3. Micro wind turbine attached intended for residential utilization. Source: Symscape; 29NOV08.

developments are available to Florida municipalities and county governments under the Energy Efficient Technologies Grant Program (FDEP 2008). This type of grant program is intended to enhance the commercialization of new energy technology in Florida. East Tampa officials could contact utilities within the State, such as Progress Energy and Florida Power and Light, who are already heavily vested in wind technology to negotiate potential deals.

Geothermal

Geothermal energy takes full advantage of Earth temperature underground. At a certain depth, the temperature remains constant year-round. For instance, during winter months, a geothermal energy unit transfer's heat from underground to inside a building or home. In the summer months, the process is reversed, taking heat from the building or home, and transferring it back into the ground (AE 2008). A geothermal heat pump system consists of indoor heat pump equipment, a ground loop, and a flow center to connect the indoor and outdoor equipment (TBS 2008). Geothermal heating system can have either open or closed piping configurations. An open system (figure 4) utilizes the heat retained in an underground body of water (COEE 2008). For instance, in Florida, engineers would integrate the heat or cooling effect of the

Florida aquifer for energy transfer. However, a source body of water must be directly underneath the structure in question. In closed loop systems, water or antifreeze solution is



Figure 4. Open source geothermal system takes advantage of fresh water bodies located underneath or near structure. Source Tradesman; 29NOV08.

circulated through plastic pipes buried underground. Depending on the temperature desired within the structure, the fluid conducts heat to or from the structure (IGSHPA 2006).

Energy generation from geothermal technology can be applied to many living features in an urban area such as East Tampa. Direct utilization of geothermal energy in the U.S. includes the heating of pools and spas, greenhouses and aquaculture facilities, space and district heating, agricultural drying, and industrial applications (Lund et al. 2005). Churches, recreation centers, public housing, city offices, and all abandoned properties could potentially benefit both financially and environmentally from geothermal technology. Most of the applications have experienced continual growth increase over the years; however, the largest annual growth has been in geothermal heat pumps, which has been in demand in the Florida market (Lund 2005). Considering the brutal summer heat East Tampa is exposed to every year, transferring heat from inside structures to underground areas makes sense.

Net Metering

Net metering is an energy transfer method in which homeowners and building managers can sell surplus energy to the local utility through grid connectivity. Florida has no state-wide net metering program, although there are several isolated utilities offering net metering options (SERC 2008). However, in June 2008, state legislators promulgated a law requiring investor-owned utilities to “develop a standardized interconnection agreement and net metering program for customer-owned renewable energy generation” by January 1, 2009 (DSIRE 2008). Tampa Electric has enacted a net metering program where they will provide full assistance in the installation and operations of a net metering system (TECO 2008). Any excess energy that is delivered to the electric grid will be allotted as a credit, for reduction on monthly energy bills (TECO 2008).

Community Energy Management

A Community Energy Management (CEM) plan could be implemented in East Tampa to provide a framework for how to adapt sustainable energy practices over time as redevelopment initiatives progress. When formulating a CEM strategy, a community should consider the current energy needs as well as the future needs of the projected population (Studley 2005). This type of initiatives focus on meeting society’s energy service needs in ways that minimize energy throughput, with potential economic and environmental benefits (Jaccard et al. 1997). For instance, CEMs could influence Brownfield site design by encouraging that certain energy goals must be met to ensure sustainability.

Green Energy Workforce Development

In 2008, the Department of Labor (DOL) announced that it would award \$10 million to fund 11 projects that will provide job-seekers with the skills necessary to enter careers in the energy industry (Labor 2008). Supported by the President's High Growth Training Initiative, this grant will also provide industry recognized technical degrees which would prove invaluable in the long-term as the country continues to transition 'green.' In fact, the DOL nominated Florida as one of the grant award recipients. Funds are currently being distributed to Worknet Pinellas, a staffing firm operating out of Clearwater. The grant money awarded to Worknet Pinellas will be used to boost training and certification for welders. The goal of the program is to train 450 welders over three years to help meet the demand for skilled craft labor crucial to the construction of nuclear power plants in Florida (TBBJ 2008).

The Center for Energy Workforce Development (CEWD) is a non-profit organization comprised of many energy companies, unions, and associations which seek to stimulate the skilled energy workforce (CEWD 2008). CEWD officials collaborate and formulate solutions to address the specific needs of individual communities throughout the country because of the looming workforce shortage in the energy industry (CEWD 2008). The CEWD is a resource in which the City of East Tampa can turn to for furthering their job training ambitions in regards to the energy industry.

Another non-profit worth taking a look at is Green For All, who are dedicated to implementing green solutions related to environmental protection and justice issues (GFA 2008). Green For All believes that a large-scale transition to a green economy can improve the health and well-being of low income people who suffer disproportionately from diseases related to pollution (GRA 2008). By switching to a green, environmentally friendly economy, new

entrepreneurial opportunities will arise which can provide work for many people looking for jobs. On their website, valuable information is available for East Tampa stakeholders to turn to for advice and inspiration.

There are many community organizations throughout the U.S. which emphasize workforce development related to energy and sustainability. For instance, Greencorps Chicago is an ex-offender program which can provide paid training in diverse environmental trades such as landscaping or environmental remediation (GFA 2008B). Another Chicago-based initiative can be found at the Wilbur Wright College in which workers can be trained in building energy technologies. The curriculum offered deals with the latest Green Building strategies such as LEED, Energy Star, and the Home Energy Rating System (GFA 2008C). Lastly, an energy program worth looking at is Solar Richmond, a California based initiative which trains low income residents in solar panel installation. This program is among the first to provide low cost and free solar installation to low income homeowners and training low income residents with the proper knowledge to accomplish the work (SR 2008).

Conclusion

Renewable energy technologies provide a reasonable means of fulfilling sustainable energy strategies at the present time. Clean energies, such as solar, wind, and geothermal can be configured in East Tampa as Brownfield redevelopment strategies occur to save money and to enhance environmental protection. A CEM establishes sustainable energy policies within a community which stakeholders must adhere too when implementing new development features. Lastly, opportunities in green jobs relating to energy are available at the present time, and should increase dramatically over the next few years, as the country continues its sustainable transition.

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**East Tampa Brownfield Revitalization:
Increasing Supply and Demand of Labor Market**

by
Angela J. Anderson

Introduction

Brownfields located in the East Tampa Community Redevelopment Area (CRA) represent a potential economic resource that through redevelopment can lead to new jobs, increased community vitality, increased local tax revenues, and healthier neighborhoods. Additionally, sustainable land-use planning and the utilization of existing land will help reduce sprawl, preserve green space, and ultimately help preserve the environment.

Since the East Tampa CRA was established in 2004, the area has undergone significant positive changes. Homes have been rehabilitated, affordable housing has been developed, businesses have relocated to the area, and environmental awareness has improved. This paper builds upon those accomplishments and evaluates how available resources can be leveraged to create jobs and job training programs that will ultimately contribute to a healthier and more sustainable community.

Job creation, defined as the net jobs added to an area over a specific time, can be influenced by both the supply side of labor as well as the demand side of labor (Roberts & Sykes, 2000). This essay focuses on both; the first part evaluates the supply side of labor and how to provide local community members with education, training, and other job-specific skills necessary to compete for jobs in the environmental field. Because the supply side can be directly influenced through education and job training programs, I will focus specifically on the training programs provided by the EPA's Brownfield Job Training Grants.

Demand side for labor can be influenced through attracting new investments, growing current businesses, and encouraging new start-ups that promote sustainability and self-employment. Successful private enterprises create wealth, jobs, and improved living standards in local communities. (The World Bank, 2006) With regards to the demand side I will focus on

how business incubators and business development centers contribute to local job creation and overall community sustainability.

Job Training

East Tampa can directly influence the supply side of labor through education and job training programs for community members. Education is critical for both cultural and economic reasons. High-quality jobs are necessary for community vitality and sustainability, and these jobs require certain skills and attributes (Wagner, Joder & Mumphrey, 2000). Job training programs, such as those offered by the EPA, are an important method of providing continuing education to disadvantaged community members.

Four specific Brownfields grants are offered through the EPA's Brownfields Program:

- Brownfields Assessment Grants: Provide funding for brownfield inventories, planning, environmental assessments, and community outreach programs.
- Brownfields Revolving Loan Fund Grants: Provide funding to capitalize loans that are used to restore brownfields.
- **Brownfields Job Training Grants: Provide environmental training for residents of brownfields communities.**
- Brownfields Cleanup Grants: Provide direct funding for cleanup activities at certain properties with planned greenspace, recreational, or other nonprofit uses (epa.gov, 2008).

These grants not only support revitalization efforts by funding environmental assessments and cleanups, but they also fund environmental job training programs (epa.gov, 2008).

Specifically, the EPA's job training grants provide up to \$200,000 over two years to fund training programs that facilitate the assessment, remediation and preparation of brownfield sites.

These targeted grants help teach community members marketable skills in environmental

cleanup and health and safety that will ultimately help them succeed in jobs created from brownfield revitalization. Past experience has shown that a lack of a skilled labor pool will result in environmental jobs going to professionals from outside the community. These training programs are specifically designed to keep those environmental jobs within the community. (epa.gov, 2008)

This EPA defines its training program as a “*job generator, leveraging jobs through assessment, cleanup, and redevelopment.*” (epa.gov) The program is designed to foster collaboration by bringing together community groups, job training organizations, educators, labor groups, investors, lenders, and developers to work together to provide training programs for residents of communities impacted by brownfields. To date the EPA has funded 131 Brownfields Job Training grants totaling over \$25 million, and more than 4,400 people have completed training. Presently 2,800 of those have obtained employment in the environmental field with an average starting hourly wage of \$13.97 (epa.gov, 2008).

The benefits of the EPA’s Brownfield Training programs go far beyond creating a skilled labor force. Not only do the programs help create a labor pool of environmental technicians, but they also help encourage economic development and environmental restoration. Furthermore, majority of graduates of the program go on to find employment in the environmental field, while others find employment in other fields or decide to further their education (epa.gov, 2008)

To develop an effective training program it is recommended that East Tampa first conduct a labor market assessment (LMA) to determine what jobs are available so they can match their training programs accordingly. Organizations have failed in the past when they provided training for jobs that simply did not exist. Best practice when conducting a LMA survey is to develop an advisory committee with local employers and recruit people willing to hire program graduates, and to develop extensive networks and alliances. Additionally, East

Tampa must decide if it wants to focus on a narrow set of technical skills, or if it wants to take a more general approach. Both methods have proven successful for other organizations provided there was up front employer involvement and commitment (Environmental Protection Agency, 2000).

East Tampa will also need to develop a recruiting program that details the benefits and reasons why participants should enroll, and what they should expect upon graduation. This could be accomplished through open houses, flyers, mentor programs, partnering with local organizations such as churches, or other public awareness campaigns. Students should also be given a realistic job preview regarding what they could expect from a career in the environmental field. To accurately select students with the competencies required for successful completion and job placement, East Tampa will need a benchmark of student academic needs, which can be accomplished through personal interviews, standardized tests, and pre-employment counseling (Environmental Protection Agency, 2000).

When conducting the recruiting process, East Tampa must be aware that the EPA Brownfield Training Grants do not provide for remedial education (see Appendix A and B for description of eligible and ineligible use of funds). Past grant recipient communities have overcome this by partnering with other organizations to provide basic training in English, math, science and computer literacy.

Upon completion of the training program, success will depend on more than strong technical skills. As part of the training process, East Tampa must help ensure that its graduates have both strong job-seeking skills, such as resume-writing and interviewing skills, and strong job-keeping skills, such as motivation, verbal and written communication skills, and a strong work ethic. East Tampa must also actively track participants for a specified length of time to monitor program success and address issues as they arise. This could be accomplished through

participant and employer feedback, home visits, and by providing incentives (Environmental Protection Agency, 2000).

Two organizations in Florida have been awarded the EPA's Brownfield Job Training Grants: Career Options of Pinellas, Inc, located in Clearwater, and Miami-Dade Community College, located in Miami. Both organizations provide examples of how training grants were used to facilitate the environmental education and training of underprivileged individuals residing in affected communities (Florida Department of Environmental Protection, 1998).

Career Options of Pinellas, Inc.

In 1998 Career Options of Pinellas, Inc. was awarded a Brownfield Job Training Grant in the amount of \$141,364 to target homeless and handicapped veterans and unemployed or underemployed residents of downtown Clearwater. Approximately 100 brownfields were identified in the downtown area, which was experiencing an economic and environmental decline due to private disinvestment. Poverty in the area reached 27 percent, and only one third of the residents were high school graduates. The EPA's grant provided for a two-month environmental technician program that offered training in the use of assessment and cleanup technologies. The goal was to train 50 students, and with the assistance of the Brownfields Advisory Board, achieve an 80 percent placement rate (epa.gov, 2008).

Miami-Dade Community College

Also in 1998 Miami-Dade Community College was awarded a Brownfield Training grant in the amount of \$200,000 to target residents of Miami's Wynwood and Model City neighborhoods who were on public assistance, unemployment, or who were from otherwise disadvantaged populations. Eighty brownfields were identified within the two communities, and

both Wynwood and Model City had a high percentage of minorities with a high school education or less. In Wynwood poverty reached 38 percent, and the unemployment rate was 11 percent, while in Model city poverty rates reached as high as 44 percent and unemployment was 15 percent (epa.gov, 2008).

The training grant allowed Miami-Dade Community College to implement a 14-week basic brownfields assessment and cleanup training program, as well as a 6-week advanced brownfields assessment and cleanup program that focused on the use of assessment and cleanup technologies. These training programs provided basic training for 100 students, and advanced training to 40 students, and with the assistance of Miami-Dade Department of Resource Management, Jobs and Education Partnership, and South Florida Association of Environmental Professionals, had a target placement rate of 80 percent (epa.gov, 2008).

The deadline to apply for FY2009 Brownfield Job Training Grants expired October 15th of this year, but guidelines for applying can be found in Appendices C-E.

Business Incubation/Development

There are two primary ways for East Tampa to influence the demand side of labor. The first is to attract businesses from outside the area; the second is to create businesses from within. Both are important and necessary for community survival, and both are avenues worth pursuit. In the context of sustainability, this essay focuses on methods to create businesses and jobs from within. As communities strive for sustainability, they must consider methods for increasing self-employment and self-sufficiency. This is necessary to increase capital retention, reduce urban flight, reduce commute time, reduce pollution, and improve overall community vitality (Grimaldi & Grandi, 2005).

Increasing self-employment means increasing small businesses. Small firms as defined by the Small Business Association represent 99.7 percent of all employer firms and employ almost half of all private sector employees. Additionally, these firms have generated 60 to 80 percent of net new jobs annually over the last decade, and pay nearly 45 percent of total U.S. private payroll. In Florida over 76 percent of firms employ less than 20 persons, while 43 percent employ 4 or less (Appendix F). In the Tampa-St. Petersburg Metropolitan Area firms with less than 20 persons have experienced the strongest growth at 18.78 percent over 5 years, with a positive increase of 10.35 percent in employment. Additionally, according to the Small Business Association, over 96 percent of growth over this period could be attributed to these firms, while large firms have experienced a modest decline in both numbers and in employees (Appendix G).

Clearly, small firms are a vital component of job creation and the economy, and because of this it is important to encourage their development and sustainability. Only 44 percent of small businesses survive at least 4 years, and that number drops to 31 percent at 7 years (sba.gov, 2008). A successful start-up phase is critical to survival, highlighting the importance of business incubation. Start-ups using the incubation process are more likely to succeed because they are *“less likely to make a fatal mistake when they are at the most fragile part of their growth.”* (Richards, 2002 pg. 22) On average incubators have a success rate of 87 percent, and in 2005 alone North American incubators assisted more than 27,000 start-ups that provided full-time employment for more than 100,000 employees, with annual revenues exceeding \$17 billion (nbia.org, 2008). Additionally, for every \$1 of public operating subsidy provided to the incubator, \$30 of local tax revenue is generated (Richards, 2002).

Incubators must be specifically designed to meet the needs of the community and stakeholders, and no two are going to be exactly the same. The most common goals of

incubators are to create jobs in a community, retain businesses in a community, and diversify the local economy. 94 percent of North American business incubators are nonprofit organizations focused on economic development, while the remaining 6 percent are for-profit endeavors established to obtain returns on shareholder investments (nbia.org, 2008). Generally speaking incubators help companies survive during the start-up period when they are most vulnerable. They fill “structural holes” in the network of relationships between entrepreneurs and investors, and they provide mentoring, resource cultivation, and networking opportunities.

However, just like start-ups, even incubators fail. One of the biggest reasons incubators fail is because they do not develop a business plan or a budget (Richards, 2002). Successful incubators must first conduct a feasibility study which will determine if they have the market, financial base, and necessary community support. Additionally, incubators must have an effective board of directors, with strong business backgrounds who are also well-networked within the community (nbia.org, 2008). It is also important for an incubator to remember that it is only as good as the businesses it selects. Therefore, they must be selective and choose clients that are able to prove business viability (Richards, 2002).

When small businesses graduate from the program, typically after 18 months to 2 years, 84 percent stay within their communities (nbia.org, 2008). These companies will build, buy or rent space, and in the case of East Tampa, would be good candidates for the brownfield redevelopment programs. When specific brownfields are revitalized the surrounding area also benefits. Studies have shown that even small-scale brownfields in mixed-use industrial/residential areas of a city have significant impacts on adjacent residential property values (Kaufman & Cloudier, 2006). Furthermore, successful redevelopment programs tend to create what is known as the multiplier effect. Success breeds success; new companies bring in jobs, they spend money on local goods and services, and while it may not be feasible to

determine the effect exactly, an average is estimated to range from 30-40 percent (Roberts & Sykes, 2000).

Traditionally incubators have focused on marketing and finance, but a growing trend is to also focus on sustainability. Some, such as New Jersey's Sustainable Business Incubator, go beyond that and focus exclusively on building sustainable businesses. The New Jersey Sustainable Business incubator focuses on "*start-up and early-stage high-growth ventures in the areas of alternative energy, the environment, waste reduction, urban agriculture, transportation and business information related to sustainable development.*" (Moore, 2008)

Along the lines of business incubators are what are referred to as business development centers. These centers provide free business counseling, training, resources and referrals to start-ups. Pinellas County is a good example of a community that has embraced the business development process. Small businesses create almost two-thirds of all new jobs in Pinellas County, and to help these entrepreneurs succeed, the Pinellas County Economic Development's Business Assistance Partnership (BAP) has partnered with Pinellas County Economic Development (PCED), local municipalities, and participating chamber of commerce. Together they work with local companies to address their concerns, to discuss challenges, and to connect them with local resources and services (Pinellas County Economic Development, 2007).

As of 2006, the PCBDC had 10 BAPs, 1,680 participants, held 140 Business Development classes, conducted 1,280 one-on-one interviews, and provided 1,470 Business Assistance solutions. Participants agree that this is a successful program that benefits not only local entrepreneurs, but also the entire Pinellas County (Pinellas County Economic Development, 2007).

Conclusion

In conclusion, the brownfields in East Tampa *represent* an enormous opportunity for economic development and community revitalization. Redevelopment can lead to new jobs, healthier neighborhoods, increased local tax revenues, and less suburban sprawl. There are many options for East Tampa to pursue, including utilizing existing brownfields and available programs to positively impact both the supply and the demand side of labor. Through utilization of the EPA's Brownfield Training Grants, East Tampa can equip its members with the education, training, and job-specific skills necessary to compete for jobs in the environmental field. With the right programs in place high quality jobs associated with redevelopment efforts will stay local as opposed to going to citizens from outside the community.

East Tampa can positively impact the demand side of labor through the creation of a sustainability-focused business incubator and/or a Business Development Center. Both strategies provide entrepreneurs with the tools and skills necessary for both early-stage and long-term survival. The incubation and development process help new ventures succeed, provides employment for community members, increases local tax revenue, and reduces urban flight. Furthermore, the success of each new business is compounded through the multiplier effect, and as a result communities experience both social and economic revitalization.

East Tampa has an enormous opportunity for economic development, and with appropriate strategies East Tampa will be well on its way towards a sustainable future.

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Appendix A

Eligible Use of Brownfield Training Grant Funds

<ul style="list-style-type: none">• Training participants in the handling and removal of hazardous substances, including training for jobs in sampling, analysis, and site remediation	<ul style="list-style-type: none">• Training in the management of facilities at which hazardous substances, pollutants, contaminants, or petroleum contamination are located
<ul style="list-style-type: none">• Training for response activities often associated with cleanups (for example, landscaping, demolition, and groundwater extraction)	<ul style="list-style-type: none">• Development and refinement of existing curriculums for training
<ul style="list-style-type: none">• Training participants in the use of techniques and methods for cleanup of hazardous substances, petroleum, and pollutants, such as leaking underground storage tanks, asbestos, lead, mold, and sites contaminated by controlled substances or mine-scarred lands	<ul style="list-style-type: none">• Training in the requirements and conduct of all appropriate inquiry as required in CERCLA 101.35B and 40CFR part 312. and due diligence
<ul style="list-style-type: none">• Training in site surveying, inventorying, mapping, and geographic information systems (GIS)	<ul style="list-style-type: none">• Training participants in planning and conducting ecological restoration of abandoned and devalued land, including general botanical classes or introductory horticultural classes related to land restoration or indigenous species revegetation, soil science; and preparing brownfield sites for water or storm water management systems
<ul style="list-style-type: none">• Training participants in the reuse of biosolids and other industry residuals to restore previously contaminated lands	<ul style="list-style-type: none">• Training participants in remediation technologies or in site preparation for the installation of technologies that use alternative energy (solar, wind, or geothermal power) on brownfield sites, or the training of “greener” remediation technologies such as phytoremediation, bioremediation, or soil amendments
<ul style="list-style-type: none">• Recruiting job training participants from communities impacted by brownfields and for outreach activities directed toward engaging prospective employers to be involved in the job training program	<ul style="list-style-type: none">• Personnel costs for instructors to conduct training, fringe benefits, and/or personnel costs for tasks associated with programmatic reporting requirements
<ul style="list-style-type: none">• Costs associated with procuring a training contractor, if reasonable; costs for screening and placing individuals of the training program	<ul style="list-style-type: none">• Costs for training materials and work gear associated with the training curriculum, if reasonable
<ul style="list-style-type: none">• Costs associated with health exams (i.e., pulmonary function tests), drug testing, or licensing fees directly related to the training	<ul style="list-style-type: none">• Costs used to cover rental fees associated with training facilities, if reasonable

and/or the placement of graduates in
environmental work, if reasonable.

- Costs associated with transportation for trainees
for site visits during training, if reasonable
-

Source: <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-10.pdf>

Appendix B

Ineligible Use of Brownfield Training Grant Funds

<ul style="list-style-type: none">• Conducting site assessments or actual cleanups outside the context of on-the-job training	<ul style="list-style-type: none">• Conducting response activities associated with cleanups except within the context of on-the-job training assignments (for example, landscaping, demolition, and groundwater extraction)
<ul style="list-style-type: none">• General or life skills education activities, such as remedial classes in math and reading; job readiness training, such as developing resumes and acquiring interview skills; job placement costs	<ul style="list-style-type: none">• GED costs
<ul style="list-style-type: none">• Transportation costs, including the costs of getting to and from class	<ul style="list-style-type: none">• Web site development
<ul style="list-style-type: none">• Vehicle or medical insurance or child care and daycare costs	<ul style="list-style-type: none">• Stipends for Students
<ul style="list-style-type: none">• Providing food or light refreshments to employees, instructors and trainees	<ul style="list-style-type: none">• Costs that are unallowable (e.g., lobbying, fund-raising, alcoholic beverages) under OMB Cost Principals 2 C.F.R. Part 220 (universities), 2 C.F.R. Part 225 (state, tribal, and local governments), or 2 CFR Part 230 (nonprofit organizations)
<ul style="list-style-type: none">• Matching any other Federal funds unless there is specific statutory authority for the match. Grant funds may be used to match state or local funds, if authorized by the relevant state statute or local ordinance	<ul style="list-style-type: none">• Administrative costs, including indirect costs, penalties, or fines

Source: <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-10.pdf>

Appendix C

Threshold Criteria

Applications that fail any one of the following threshold criteria will not be considered.

<ul style="list-style-type: none">• Organization must be an eligible applicant and non-profit organizations must provide documentation of non-profit status.	<ul style="list-style-type: none">• Applicants that received a brownfields job training grant from EPA in fiscal year 2008 are not eligible to apply in fiscal year 2009. Applicants who received a brownfields job training grant in or before fiscal year 2007 are eligible to apply.
<ul style="list-style-type: none">• Proposed project must be in a community that currently receives, or has received, financial assistance (federal, state, or tribal) for brownfields assessment, revolving loan fund, cleanup, site-specific response program work, and/or EPA funded targeted brownfields assessments.	<ul style="list-style-type: none">• Proposed project must adhere to stated eligible use of funds.
<ul style="list-style-type: none">• Proposed project cannot duplicate other federally funded Environmental Job Training Programs.	<ul style="list-style-type: none">• Organization must document that its curriculum will include OSHA 29 CFR 1910.120 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. All curriculums must include this training and provide it to all individuals entering training.
<ul style="list-style-type: none">• Application packages must substantially conform to required outline and content.	<ul style="list-style-type: none">• Application and all attachments must be in English.

Source: <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-10.pdf>

Appendix D

Application Process

Following is an abbreviation description of the application process: Individual grant application forms may be downloaded from EPA's Grants and Debarment website <http://www.epa.gov/ogd/AppKit/application.htm>

All application packages must contain a "Narrative Proposal," related "Attachments", and one completed and signed Standard Form 424 (SF 424) "Application for Federal Assistance."

- **Narrative Proposal:**

- Cover Letter: Brief description of project written on official letterhead and signed by authorized official. The cover letter must also include:

• Applicant Identification	• Location	• Contacts
• Date Submitted	• Project period	• Population
• Other	• Cooperative Partners	• Funding Requested
• Detailed Project Description	• Project Workplan – training objectives and plans	• Performance Measurement – anticipated outcomes/outputs
• Programmatic capability	• Environmental results past performance	• Community involvement and employer partnerships
• Community need	• Budget/Resources	• Management fees
• Leveraging		

- **Attachments**

-
- | | |
|--|--|
| • References <ul style="list-style-type: none">○ Two employers who have hired participants from your job training program.○ At least two neighborhood and/or community-based organizations you currently are working with in developing your proposed job training program.○ Two organizations from the employer community who have been involved in the development of the proposed job training program. | • Training Program Outline |
| | • A copy of a current dated and signed letter informing the appropriate state or tribal governmental environmental program of your plans to apply to EPA. for a Brownfields Job Training grant |
| | • Milestones Timetable |
| | • General Support Letters |
| | • Documentation of Nonprofit Status, if applicable. |
-

- **Standard Form 424 (SF-424), Application for Federal Assistance**

Source: <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-10.pdf>

Appendix E

Criterion for Evaluation

Each application will be rated under a points system, with a total of 100 points possible.

Criterion	Max. Points Per Criterion
<p>Project Workplan - Training Program Objectives and Plans.</p> <p>Training program outline is clearly identified and comprehensive. (5 points)</p> <p>Recruitment criteria ensures participant graduation, potential fees are responsibility of participants, accessibility of training facilities (e.g., proximity to public transportation, parking, etc.). (5 points)</p> <p>Local job development strategies have been developed, the likelihood that these strategies will support the placement of graduates in on-going brownfield assessment and cleanup activities, the likelihood that the marketing strategy of the training program will increase graduates being placed in full-time positions, and local incentives or other mechanisms will be utilized or encouraged to increase the employment of graduates and the overall training program's success. (5 points)</p>	15 pts
<p>Performance Measurement: Anticipated Outcomes and Outputs.</p> <p>Anticipated environmental outcomes and outputs are clearly outlined. (3 points)</p> <p>Measures of success are clearly described for the project. (3 points)</p> <p>Description of how success in achieving project outcomes and outputs will be evaluated and measured. (3 points)</p> <p>The milestones and objectives are specific, measurable, and realistic, and the strategy for continuation of the job training program after original funding has been exhausted is detailed and realistic. (3 points)</p> <p>Applicant ensures sustainable employment, including initial job placement, retention, and continuous employment for participants of the job training program; applicant has designed a strategy to ensure successful implementation of evaluation measure; applicant provides job search support and resources for participants; participants of the job training program are able to access these resources; applicant will track graduates. (3 points)</p>	15 pts
<p>Programmatic Capability.</p> <p>Past performance in successfully completing and managing federally funded assistance agreements similar in size, scope, and relevance to the proposed project performed within the last 3 years. (2 points)</p> <p>History of meeting reporting requirements under federally funded assistance agreements similar in size, scope, and relevance to the proposed project performed within the last 3 years and submitting acceptable final technical reports under those agreements. (2 points)</p> <p>Organizational experience and plan for timely and successfully achieving the objectives of the proposed project. (2 points)</p> <p>Staff expertise/qualifications, staff knowledge, and resources or the ability to obtain</p>	10 pts

them to successfully achieve the goals of the project. (2 points)

Success in delivering an effective environmental job training program that illustrates experience in working with minority, unemployed, and/or underemployed individuals in the targeted community. (2 points)

Environmental Results Past Performance.

Adequately documented and/or reported on progress towards achieving the expected results under Federal agency assistance agreements performed within the last three years, and if such progress was not being made whether the applicant adequately documented and/or reported why not. (5 points)

Achieved original training and placement goals as a past EPA Brownfields Job Training grantee, and if the original anticipated training and placement goals were not met, what steps were taken to improve the program and what new strategies were implemented to place graduates. (5 points)

10 pts

Community Involvement and Employer Partnerships.

Efforts have been made to collaborate with brownfield assessment and cleanup grantees, contractors, and/or brownfield site owners in the targeted community; efforts have been made to enhance and foster future employment for job training graduates in the targeted community. (5 points)

Early steps were taken during the development of the application to notify and involve the community. (5 points)

Efforts were made to partner with local community groups, labor unions with apprenticeship programs, Workforce Investment Boards, and academic institutions located in or near the brownfield community to provide non-environmental training; the proposed project will ensure trainees are job-ready. (5 points)

25 pts

Efforts have been made to partner with the state and/or Tribal government environmental office to facilitate the placement of graduates in remediation work. (5 points)

The employer community has been involved in the development of the proposed job training program. (5 points)

Community Need.

Demographic information and indicators, such as the poverty rate, minority populations, and the unemployment rate present in the target community; the impact that the presence of these indicators has on the target community and how these indicators relate to current brownfields challenges in the targeted community, including environmental, social, public health, and economic issues. (5 points)

Environmental justice concerns, or the disproportionate impact of brownfields or other environmental contamination and risks, faced by low-income, minority, or socio-economically disadvantaged populations within the targeted community. (5 points)

15 pts

Labor market assessment information conducted by the applicant in the targeted community indicating a demand for skilled environmental professionals with the certifications proposed and incorporated into the proposed curriculum, and certifications graduates will earn ensuring employment and directly applicable to the hiring needs of employers in the community. (5 points)

Budget/Resources.

The budget is clearly stated, detailed, reasonable, and appropriate to achieve the project's objectives and includes cost estimates for each of the proposed project

5 pts

activities to be performed with EPA funds. (5 points)

Leveraging.

The application demonstrates (i) how the applicant will coordinate/leverage the use of EPA funding with other Federal and/or non-Federal sources of funds to carry out the proposed project, and/or (ii) that EPA funding will complement activities relevant to the proposed project carried out by the applicant with other sources of funds or resources. (5 points)

5 pts

Source: <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-10.pdf>

Appendix F

Employer Firms, Establishments, Employment, Annual Payroll and Receipts by Firm Size, and State, 2005
(Annual payroll and receipts in thousands of dollars)

State	Total	Employment Size of Firm							500+	
		0*	1*-4	5-9	10-19	<20	20-99	100-499		<500
United States	5,983,546	823,832	2,854,047	1,050,062	629,946	5,357,887	520,897	87,285	5,966,069	17,477
Florida	421,880	69,373	218,385	62,177	34,228	384,163	27,228	6,306	417,697	4,183
Establishments	504,662	69,429	218,629	62,640	35,588	386,286	32,984	16,263	435,533	69,129
Employment	7,107,378	0	430,041	405,174	454,367	1,289,582	1,032,869	857,734	3,180,185	3,927,193
Annual payroll	239,197,889	3,450,154	12,688,228	12,264,438	14,230,492	42,633,312	33,754,924	29,097,528	105,485,764	133,712,125
% of Ttl FL Estab.	13.76%	0.00%	43.32%	12.41%	7.05%	76.54%	6.54%	3.22%	86.30%	13.70%
Accum % Ttl FL Estab.	13.76%	0.00%	57.08%	69.49%	76.54%	76.54%	83.08%	86.30%	86.30%	100.00%
% of Ttl FL Emp	0.00%	0.00%	6.05%	5.70%	6.39%	18.14%	14.53%	12.07%	44.74%	55.26%
Accum % Ttl FL Emp	0.00%	0.00%	6.05%	11.75%	18.14%	18.14%	32.68%	44.74%	44.74%	100.00%
% Ttl FL Payroll	1.44%	1.44%	5.30%	5.13%	5.95%	17.82%	14.11%	12.16%	44.10%	55.90%
Accum % Ttl FL Payroll	1.44%	1.44%	6.75%	11.87%	17.82%	17.82%	31.94%	44.10%	44.10%	100.00%

* Employment is measured in March, thus some firms (start-ups after March, closures before March, and seasonal firms) will have zero employment and some annual payroll.
Notes: For state data, a firm is defined as an aggregation of all establishments owned by a parent company within a state.
Establishments are nonfarm locations with active payroll in any quarter.

Source: U.S. Small Business Administration, Office of Advocacy, based on data provided by the U.S. Census Bureau.

Appendix G

Employer Firms, Employment, and Annual Payroll by Firm Size and Metropolitan Statistical Area
Metropolitan Statistical Area Tampa-St. Petersburg-Clearwater, FL

Year	Firms										Employment						Annual Payroll (Thousands of Dollars)								
	Employment Size of Firm					% to Ttl					Employment			Employment Size of Firm			Total			Employment Size of Firm			Total		
	Total	% Inc/Dec	<20	% Inc/Dec	% to Ttl	<500	% Inc/Dec	% to Ttl	500+	% to Ttl	% to Ttl	<20	<500	500+	<20	<500	500+	<20	<500	500+	<20	<500	500+		
2005	59,706	4.30%	52,503	4.89%	87.94%	57,764	4.45%	96.75%	1,942	96.75%	991,638	175,582	441,818	549,820	34,903,453	5,860,373	15,110,056	19,793,397	33,099,998	5,423,457	13,850,038	19,249,960			
2004	57,243	5.42%	50,056	5.95%	87.44%	55,304	5.62%	96.61%	1,939	96.61%	990,707	172,704	434,105	556,602	33,091,810	4,991,112	12,909,651	20,182,159	33,019,389	4,815,218	12,288,095	20,731,294			
2003	54,301	2.72%	47,243	2.72%	87.00%	52,359	2.84%	96.42%	1,942	96.42%	993,595	166,720	419,547	574,048	32,601,560	4,746,976	12,313,433	20,288,127	30,980,234	4,510,648	11,905,108	19,075,126			
2002	52,865	3.03%	45,993	3.29%	87.00%	50,912	3.23%	96.31%	1,953	96.31%	1,009,648	161,951	400,729	608,919	1,042,912	160,193	402,981	639,931	1,032,745	159,118	404,716	628,029			
2001	51,308	0.46%	44,529	0.74%	86.79%	49,318	0.49%	96.12%	1,990	96.12%	1,032,745	159,118	404,716	628,029	1,032,745	159,118	404,716	628,029	1,032,745	159,118	404,716	628,029			
2000	51,072		44,201		86.55%	49,077		96.09%	1,995	96.09%	1,032,745	159,118	404,716	628,029	1,032,745	159,118	404,716	628,029	1,032,745	159,118	404,716	628,029			

5 Yr Change		5 Yr Change		5 Yr Change	
Firms	Employment	Employment	Payroll	Employment	Payroll
Total	16.91%	-3.98%	12.66%		
<20	18.78%	10.35%	29.92%		
<500	17.70%	9.17%	26.92%		
500+	-2.66%	-12.45%	3.77%		

5 Yr Change		5 Yr Change		5 Yr Change	
Firms	Employment	Employment	Payroll	Employment	Payroll
Total	8,634	-41,107	3,923,219		
<20	8,302	16,464	1,349,725		
<500	8,687	37,102	3,204,948		
500+	-53	-78,209	718,271		

Notes: For metropolitan statistical area data, a firm is defined as an aggregation of all establishments owned by a parent company within an MSA. Establishments are nonfarm locations with active payroll in any quarter. Employment is measured in March; thus, some firms will have no employment and some annual payroll.

Source: U.S. Small Business Administration, Office of Advocacy, based on data provided by the U.S. Census Bureau, Statistics of U.S. Businesses.

Brownfields Redevelopment: An Opportunity for Rainwater Harvesting

by
Leslie A. North

A Need for Rainwater Harvesting

Scientists speculate water will become the oil of the 21st century, as the availability of freshwater is rapidly decreasing worldwide (Kinkade-Levario, 2007). In the United States, the US Geological Survey confirmed that at least 36 states will face water shortages within five years (Reilly, 2008). Thus, as the importance of sustainable living intensifies and the environmental and economical costs of providing freshwater through centralized water systems escalate, communities throughout the nation will be forced to renew interest in sustainable rainwater harvesting technologies (Kinkade-Levario, 2002).

Florida is commonly said to represent one of the nation's greatest water ironies. When founded, the largest concern in the state was an over abundance of water, now too little water is becoming a harsh reality. Florida, Texas, and California alone use over a quarter of all freshwater supplies in the United States (Hutson et al., 2005). Just in Florida, approximately 2.4 trillion gallons of freshwater are used each year, with this number expected to rise to 3.3 trillion gallons of water per year by the year 2025 (Rainwater Harvesting Inc.com, 2008). Hence, freshwater supplies are diminishing throughout the State. In Hillsborough County, water levels decreased an average of 0.25 meters in October 2005 alone, despite the County having record amounts of rainfall during the same month (SWFWMD, 2005). In total, the Floridan Aquifer underneath Hillsborough has declined an average of three to six meters since the 1930s when extensive pumping of the aquifer began, and in some areas has decreased as much as thirteen meters (SWFWMD 2005, 2001, 1993).

Ninety-seven percent of the water extracted in the Tampa Bay Metropolitan Area is for municipal use (Stewart, 1986). Much of this water is used for house cleaning, flushing toilets, gardening, and washing clothes. Consequently, Florida's water management agencies believe the

State may soon be forced to use water supplies beyond ground and surface water for non-potable uses to reduce dependence on remaining freshwater supplies (Rainwater Harvesting Inc.com, 2008). Consequently, there is a need for Florida's communities to begin preparing for water shortages and increased water costs. Fortunately, the revitalization efforts underway in East Tampa present an opportunity for the community to begin these preparations by investing in feasible rainwater harvesting technologies. The following describes how East Tampa can redevelop brownfields to meet the redevelopment goals of improving the environment, increasing job opportunities, and enhancing human health, while also promoting sustainable development, reducing their freshwater footprint, and creating an area committed to using rainwater to the fullest extent.

Designing and Constructing Rainwater Harvesting Systems

Rainwater harvesting refers to the gathering and storing of rainwater for use as needed. Once this rain hits the ground, it is referred to as stormwater (Woolley et al., 1997). The principles of rainwater harvesting date back to 3000 BC in India, where stone-rubble structures were used to capture and distribute rainwater. Since then, the concept of rainwater collection has spread throughout the countries of the world as it continually proves to be cost efficient in numerous situations. In 1997 more than 300,000 rainwater harvesting systems were in use in the United States alone (Kinkade-Levario, 2007).

Designing and implementing a rainwater harvesting system begins with answering questions regarding the need to retrofit, size, cost, purpose, and intensity of use (Kinkade-Levario, 2002). Retrofitting an existing building or landscape is generally more expensive and intensive than designing a rainwater system for a new building or site (Woolley et al., 1997). For this reason, East Tampa developers must initially commit to fitting new construction, as opposed

to preexisting buildings, with rainwater capturing devices. Yet, because the cost to install a basic rainwater system at a single-family residence is low, the domestic use of rainwater at both existing and newly constructed homes should be rigorously encouraged in East Tampa.

When determining the size of a rainwater harvesting system, a water budget should be conducted. Water balance analysis, which focuses largely on average annual rainfall data and planned uses, determines how much rainwater can be collected by the projected catchment area, so supply and demand estimates can be made to determine the minimum size of a cistern or tank (Kinkade-Levario, 2002). A loss of ten to seventy percent of rainwater is expected due to evaporation or collection inefficiencies, so the rainwater harvesting potential in an area must be high for maximum efficiency (Kinkade-Levario, 2007). For small municipal projects in East Tampa, which receives large quantities of relatively uniform rainfall capable of continually replenishing supplies, small systems (<4,000 gallons) are needed. Even smaller containers, approximately the size of a standard barrel, are needed to adequately supply water for non-potable uses at single-family residences. For larger scale centralized projects in East Tampa, such as the construction of a tank designed to hold captured stormwater runoff, a large cistern (10,000 – 25,000 gallons) would be needed (Woolley et al., 1997).

Irregardless of size or purpose, all rainwater harvesting systems consist of six components: 1) catchment, 2) conveyance, 3) filtration, 4) storage, 5) distribution, and 6) purification (Kinkade-Levario, 2007). The catchment area, defined as the surface upon which rain falls, can consist of a roof, impervious pavement, rainbarn, or specialized landscaped area. The channels and pipes used to transport rainwater from the catchment to storage area are known as conveyance systems. Common rainwater conveyance systems utilized include landscape swales, sloped sidewalks, street gutters, or roof gutters and downspouts (Boers & Ben-Asher, 1981). Filtration, which involves the removal of contaminants and debris from stored rainwater,

can be achieved through the use of gutter leaf guards, screens, or first-flush devices which are most often employed when the water is intended for human consumption (Kinkade-Levario, 2002). Filtration systems help to reduce the need for frequent tank cleaning, concentrations of bacteria, nutrient concentrations, and mosquito larvae growth.

Storage refers to the cistern or tank where collected rainwater is stored. These devices represent the largest investment in a rainwater harvesting system because they are comprised of several components including a roof, sides, base, water inlet, water outlet, access hatch, and means of drainage (Woolley et al., 1997). Factors to consider when selecting a storage system include the options available locally, space availability, desired storage quantity, cost, and aesthetics (Table 1). In addition, in communities such as East Tampa, the primary concern of storage devices must be maintaining safety, so all household and commercial storage containers should be tied down and larger centralized tanks should be fenced and gated. Distribution refers to the system that delivers captured rainwater. This can occur by gravity or pumping. Generally, small residential systems work under gravity by slightly elevating tanks off the ground, while larger devices employ the use of pumps. Lastly, purification refers to the use any filtering equipment, distillation, or additives used to settle, filter, and disinfect collected rainwater (Kinkade-Levario, 2007).

Material	Estimated Cost	Typical Size
Barrel (Plastic Rain, wooden whiskey, or metal)	Free, to \$300 per barrel	200 – 500 gallons
Concrete or Ferro-Cement (Precast concrete tanks)	\$0.35 up to \$1.50 per gallon	Any
Fiberglass	\$0.50 to \$2.00 per gallon	500 – 20,000 gallons
Metal (Corrugated with liner, galvanized steel)	\$0.30 to \$2.79 per gallon	150 – 104,000 gallons
Polyethylene	\$0.50 to \$1.90 per gallon	210 – 5,000 gallons
Polypropylene	\$0.35 to \$1.00 per gallon	290 – 20,000 gallons
Welded steel (Bolted stainless steel)	\$0.80 to \$4.00 per gallon	1,000 – 1 million gallons
Wooden (Treated wood with liners)	\$0.88 to \$2.06 per gallon	700 – 2 million gallons
Stone	Very expensive; up to \$1.00 per square foot of tank surface area	Any
Crates: Invisible Structures RainStore 3	\$8.00 per cubic foot	Any
Crates: Atlantis	\$4.84 to \$5.15 per cubic foot	Any

Table 1. This table illustrates the estimated cost of building material commonly used to construct cisterns or tanks. The material commonly used in relation to tank size is also provided.

Studies investigating contamination in captured rainwater by Simmons et al. (2000) in Auckland, New Zealand and Sazakli et al. (2007) in Kefalonia Island, Greece revealed that roof-collected rainwater systems should not provide potable water supply, but can successfully minimize the use of water in various other household activities. Therefore, it is recommended that the East Tampa Development Committee not encourage the use of rainwater harvesting systems for supplying potable water. Costs will also be reduced by discouraging the potable use

of rainwater since purification systems are only needed when rainwater is intended for human consumption (Kinkade-Levario, 2007).

Large, centralized rainwater harvesting systems vary greatly in size and material used; East Tampa designers should conduct independent research to build a system best suited for their specific needs. At single family households, rainwater harvesting devices can be easily built with a spicket and food grade barrel. Using food grade barrels ensures any captured rainwater can be placed on garden produce without the risk of leachate contamination. Food grade barrels can be purchased locally from most major food distribution centers or restaurants. Feed Depot at the corner of Bearss and Nebraska Avenues, supplies food grade barrels for \$18 each (Walker, personal communication). In Florida, black barrels work best, as they naturally warm in the sun, killing any bacteria or insect larvae in the captured rainwater.

Often the lid on food grade barrels consists of two parts: a solid plastic cap and a ring which screws around the cap, holding it in place. This lid structure allows citizens to replace the solid lid cover with rustproof fiberglass screening, to allow water, not debris to enter the barrel (Kinkade-Levario, 2007). Approximately one foot from the bottom of the barrel, a hole should be drilled and a male spicket from the local hardware store installed. The average cost of a simple water spicket is \$4. When installed, the spicket should be sealed in place using rubber cement, which is also available at multiple local hardware stores (Walker, personal communication). Once created the barrel can be elevated with blocks or placed direct on the land surface (Figure 1). If elevated, the barrel should be securely tied to a structure to prevent injury.

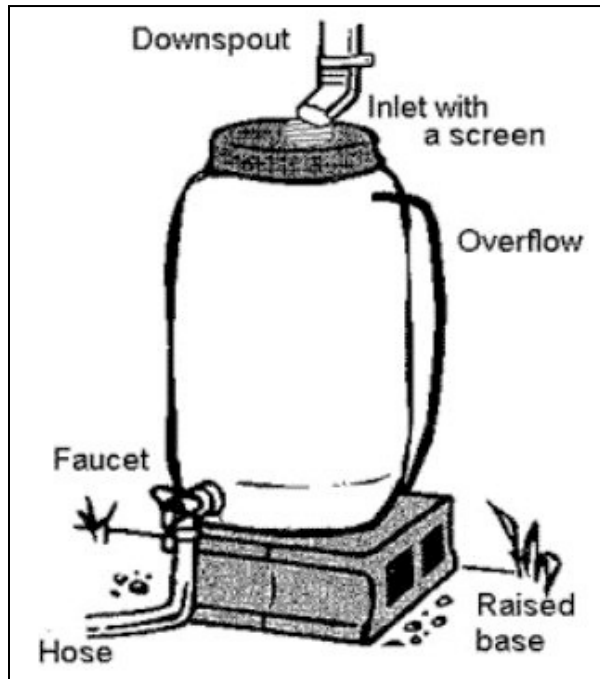


Figure 1. Illustration of Completed Residential Rainwater Harvesting System. Taken from Shingle Creek Watershed Management Commission Website on November 8, 2008.

Once a barrel is completed, roof guttering must be installed to funnel water into the capturing device. This is true whether the device is located at a single-family residence or larger commercial building. In *Green Building Handbook*, Woolley et al. (1997) analyzed the environmental impact and cost of the common materials used to collect rainwater runoff from roofs. After evaluating the production and use of aluminum, cast iron, steel, glass reinforced polyester, timber, bamboo, and PVC for environmental degradation and human health risk, the authors revealed that no one material stood out as being significantly more environmentally friendly or safer for human health. However, the authors determined the cost and product safety report of glass reinforced polyester and PVC compared to other options proved they were the best choice. Of these two material choices, PVC was found to be the most cost efficient; thus, Schedule 40 PVC, which is made from ‘virgin’ material (Kinkade-Levario, 2007), is recommend

for use as guttering and piping in East Tampa. Coated aluminum or PVC downspouts, not copper or galvanized downspouts should also be used (Woolley et al., 1997).

Brownfields and the Opportunity for Rainwater Harvesting

Although rainwater harvesting does not provide much of the economic benefits attainable through other proposed projects, it does present a wide variety of opportunities in East Tampa that will help the area achieve many redevelopment project goals. These include, but are not limited to, minimizing urban flooding, increasing job opportunities, improving environmental conditions, achieving LEED certification, increasing environmental awareness, reducing domestic water costs, minimizing soil erosion, and potentially enhancing community funding through the US EPA Brownfields Sustainable Pilot Projects Grants.

Minimizing Urban Flooding

Stormwater management through rainwater catchment can be achieved through active or passive techniques. Active techniques involve the ‘active’ collection and storing of rainwater for use in other areas. Passive rainwater catchment, which utilizes a more natural approach to stormwater control, operates under the principle that in natural environments almost all rainwater soaks into the ground, supporting plant life, maximizing groundwater recharge, and minimizing flooding. This method entails using permeable surfaces, rain gardens, swales, microbasins, and/or site grading techniques to divert stormwater into specialized landscaped areas (Kinkade-Levario, 2007). Thus, pursuing passive stormwater capturing techniques in East Tampa could benefit both the environment and the citizens residing in the area.

Although active stormwater capturing may initially sound unrealistic and costly, reducing urban flooding through rainwater harvesting techniques is heavily pursued in Europe and the

United States (Kinkade-Levario, 2007). Germany, for example, recently explored the concept of actively capturing runoff in large centralized cisterns and using this polluted rainwater from urban traffic surfaces to decrease water needs and stormwater flooding (Nolde, 2006). Work conducted by Nolde (2006) revealed that rainwater diverted into cisterns from low traffic density streets in urban areas is polluted, but can be inexpensively treated with biological filters and ultraviolet light. He proposed that this treated rainwater could then be distributed and used for flushing toilets and watering gardens, which would result in a reduction in water consumption, stormwater flooding, and the level of pollutants entering nearby surface water bodies. Similar techniques are also under development in Tokyo, Japan (Furumai, 2008).

In Portland, Oregon, passive rainwater catchment is undertaken. The city has committed to controlling stormwater naturally in their Green Streets Program. The goal of this program is to convert underutilized landscape areas adjacent to streets into stormwater planters designed to slow, cleanse, and infiltrate stormwater. The process works by cutting channels into the curbs lining landscaped areas along roadsides. Water flows into these areas, rather than down the street, where it is cleansed and slowly infiltrated into the soil as it flows over the natural landscape. The curbed areas are connected so water, which has traveled through one landscaped area will flow to the next landscaped are, continuing the cleansing and infiltration process (Figure 2) (Kinkade-Levario, 2007; Portland Bureau of Environmental Services, 2008).



Figure 2. Photograph of Portland street showing landscaped curbside used to capture and treat stormwater. Notice the notched curbed allowing water to enter the landscaped area and the grates used to connect neighboring curbs. Photo by Dave Elkin at Sustainable Stormwater Inc.

Increasing Job Opportunities

If a commitment to actively pursue rainwater harvesting in East Tampa is made, a market for persons capable of building and maintaining rainwater systems will be created. Regularly maintaining rainwater catchment devices is essential to upholding good water quality as evidenced by research conducted in Auckland, New Zealand (Simmons et al., 2000), Kefalonia Island, Greece (Sazakli et al., 2007), and Jordan (Abdulla & Al-Shareef, 2006). Therefore, because trained rainwater harvesting technicians should be regularly employed to construct, install, and maintain rainwater devices, there is increased potential for job opportunities in East Tampa with the utilization of household and commercial rainwater collection devices. In addition, overhanging branches increase the likelihood for rainwater contamination, potentially leading to an increased need for tree trimmers (Kinkade-Levario, 2007).

Work conducted by Lange and McNeil (2004), revealed that total development costs, community support, willingness of lending institutions to support redevelopment, availability of financial incentives, and the quality of jobs to be created by redevelopment each influence business decisions made in brownfield areas. Of these, community support was overwhelming reported as the leading factor encouraging businesses to move to redeveloping area. Thus, if East Tampa commits to utilizing rainwater harvesting technologies community wide, rainwater harvesting device manufacturers, such as Rainwater Harvesting Incorporated or Rainwater Recovery Incorporated, could be encouraged to build a facility on a known brownfield site, increasing tax revenue and job availability in the East Tampa community

Enhancing LEED Certification

Greening East Tampa is a stated goal of the area's brownfields redevelopment project. Rainwater harvesting is a recognized sustainable practice that if actively pursued will help to achieve this goal. Installing rainwater harvesting devices throughout East Tampa will also result in the community receiving Leadership in Energy and Environmental Design (LEED) credit points. Committing to the implementation of a LEED strategy will help the East Tampa community reduce environmental impacts, improve the economy, and enhance the quality of living in the area (US Green Building Council, 2008).

According to the LEED certification rating system, a possible two LEED certification points can be achieved if potable water use for landscape irrigation is eliminated or reduced by fifty percent (US Green Building Council, 2008). This standard can easily be achieved in East Tampa through the planting drought tolerant plants and capturing rainwater in onsite cisterns or tanks. An additional point can be earned by reducing water use within a building by twenty percent. The US Green Building Council states this goal is attainable by installing water-

conserving fixtures or utilizing captured rainwater for toilet flushing. If water use is reduced by thirty percent an additional LEED certification point will be granted (US Green Building Council, 2008). Thus, given the ease with which LEED certification points can be earned by utilizing rainwater harvesting devices, it is recommended that East Tampa implement a policy for new businesses, government buildings, and residential complexes to mandatorily utilize rainwater harvesting techniques.

Residential Benefits

As the availability of water continues to decrease, the cost of water will increase. The average Tampa residence uses 7,500 gallons of water per month (City of Tampa Government.com, 2008). At \$0.005 per gallon, the average cost of water for city of Tampa residents is \$37.50. In addition, as water supplies become more privatized in the Tampa Bay region, with the Tampa Bay Water Organization likely to take over providing freshwater supplies for East Tampa residents in the near future, the cost of water for private residents is expected to rise (Tampa Bay Water, 2008). With the median household income in East Tampa only being \$30,300.00 per year (U.S. Census Bureau, 2000), and an economic crisis looming, residents will be faced with the reality of having less money to pay more expensive bills. Thus, an alternative, free source of water can greatly benefit the residents of East Tampa. Dioxin et al. (1999) showed small volume rainwater storage and reuse can result in a savings of up to eighty percent. The only cost of rainwater harvesting is for the materials needed to construct and maintain a capturing device, leaving more money for other rising expenses. In addition, home owners will be able to wash their vehicles, water their lawns, and care for their gardens without concern for increasingly stricter watering restrictions.

As aforementioned, with time East Tampa should integrate city-operated rainwater harvesting and distribution facilities on brownfields. Although Apostolidis and Hutton (2006) and Konig (1999) both found the initial cost of installing distributional pipework a challenge to completing this task, they discovered a city-operated rainwater collection and distribution facility could result in approximately sixty percent less water being used than traditional water services solely distributing potable water. A significant reduction in stormwater runoff would also occur.

Brownfields Pilot Projects Funding

As a tax increment finance area, the East Tampa Community Redevelopment Area stands to benefit economically from investing resources into tax generating businesses, capable of increasing the community's tax base, thereby increasing the funds available for other brownfields redevelopment projects. Unfortunately, aside from encouraging rainwater harvesting corporations to run business from the East Tampa community, investing in rainwater harvesting admittedly runs counter to the goal of increasing the community's tax base. However, pursuing rainwater harvesting in the area can be a lucrative investment through the Brownfields Sustainable Pilot Projects Program.

Through the Brownfields Sustainable Pilot Projects Program, the EPA is offering communities between \$20,000 and \$50,000 in assistance to develop and complete sustainable projects during brownfields redevelopment. The EPA will work with qualifying communities to "incorporate sustainable redevelopment into the planning, design, and implementation of their brownfields projects" (Petteway, 2008). These funds will help in the cleanup and redevelopment of brownfields while also completing projects that demonstrate best management practices which can be mimicked by other communities (US EPA, 2008). Projects can focus on green infrastructure, energy efficiency, native landscaping, or water conservation, amongst others.

Thus far, more than \$500,000 in assistance has been allocated to sixteen Brownfields Sustainable Pilots. Specific examples of approved projects include an analysis of green roofs in Roxbury, Massachusetts, feasibility analysis of recycling materials from textile mills in Valley, Alabama, and developing sustainable stormwater management strategies in Detroit, Michigan. Currently, no pilot projects focusing on rainwater harvesting in brownfields redevelopment are proposed. East Tampa could fill this gap by proposing a feasibility project focusing on the use of rainwater at domestic, industrial, and commercial development or the use of rainwater harvesting for stormwater control. Thus, the monetary loss from investing money and brownfield land into this non-tax generating project would be offset. In addition, as aforementioned, such a project would help the community achieve the desired LEED certification.

Conclusions

In summation, rainwater harvesting should be pursued during the East Tampa Brownfields Revitalization efforts currently underway. Rainwater harvesting can benefit the community in multiple ways including reducing groundwater withdrawals, minimizing stormwater flooding, increasing job opportunities, increasing the tax base, reducing water costs to citizens, and assisting the community in attaining LEED certification. Decentralized rainwater harvesting systems, will likely be most successful in the community, although with time centralized rainwater harvesting systems designed to help reduce stormwater flooding and distribute rainwater to the citizens of East Tampa could hold potential.

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**Brownfield Redevelopment to Improve Access to Food in
East Tampa**

by
Monetta S Wilson

Introduction

There is a significant relationship between fresh food availability and health. A diet lacking in fresh produce and other healthy foods can lead to health problems such as obesity and diabetes (Drewonski, 2004). This is especially evident in low-income urban areas. These areas in the United States have very little supermarkets and grocery stores (Algert et al, 2006; Initiative, 2002; Lane, 2008; Sloane; 2003). They areas usually have a large number of corner stores that carry limited or no fresh produce but have a large amount of cheap highly processed junk food (Drewonski, 2004). Also, residents of low income neighborhoods tend to have little access to private transportation making it difficult to travel long distances to the nearest supermarket (Algert et. al., 2006). As a result it is cheaper and more convenient to make unhealthy food choices. This is a problem in many areas of the United States, and is especially evident in the community of East Tampa Florida.

East Tampa is comprised of thirteen neighborhoods in the east of the city of Tampa (Brownfields, undated). The community is at the beginning of a transformation aimed at revitalizing the local neighborhoods while addressing some of the major issues facing it. One of the major concerns of the people of East Tampa is the prevalence of many diet related health conditions in the community, such as diabetes and heart disease. In addition, there are concerns about the availability of healthy food. There are only two supermarkets in the nearly eight square mile community (Brownfields, undated). Given the lack of supermarkets and the prevalence of chronic illnesses there is a need to address health of East Tampa residents by increasing access to healthy food. There are many resources in East Tampa resources that can be used to address the problem of fresh food availability. Some of these are the many churches, schools, community groups, and brownfields located in the community. These resources can be

successfully incorporated as part of a comprehensive food plan to improve the health of East Tampa residents through increased consumption of healthy food.

One of the major initiatives in the revitalization of East Tampa is brownfield redevelopment. Brownfields are abandoned, idled, or underused industrial or commercial properties where expansion, reuse, or redevelopment may be complicated by real or perceived environmental conditions (FBA, undated). The redevelopment of brownfields can be beneficial in many ways. They not only facilitate the removal of harmful substances from the environment but can also be used to address major concerns of the community. In many places brownfield redevelopment has added much needed services and value to the community. McCarthy (2002) suggests that brownfield redevelopment is most successful when connected to broader community goals. In East Tampa, brownfield redevelopment can form the cornerstone of a comprehensive food plan to increase fresh food availability in East Tampa thereby connecting to community goals and enhancing the quality of life.

This paper proposes the development of a comprehensive food plan to improve access to healthy food in East Tampa. The proposed plan will utilize brownfield redevelopment as part of the strategy to increase fresh produce consumption. The ideal food plan would increase the number of supermarkets in the community, increase educational programs and create diverse sources of affordable fresh produce.

Food availability and health

Several studies establish the relationship between inadequate fresh produce consumption and an increased risk of cardiovascular disease, obesity and overall poor health (Algert et. al, 2006). These studies show that healthy eating and adequate physical activity can help prevent

these detrimental health conditions (Sloane et al., 2003). The Centers for Disease Control and Prevention recommend that the average adult consumes at least four cups of fruit and vegetables a day (CDC, undated). The relationship between the availability of healthy foods and consumption of these foods has been studied extensively. These studies show that in areas where there is limited access to affordable healthy foods there is usually a high occurrence of chronic illness, obesity and low birth weight (Drewonski, 2004, Lane et al, 2004, Schultz et al, 2005). One such study, conducted in Syracuse, NY found that mothers who lived in areas with no supermarket were three times more likely than those who lived in proximity to supermarkets to have babies with unexplained low birth weight (Lane et al, 2008). This study also found that proximity to supermarkets played a larger role in determining birth weight than other socioeconomic factors such as race and ethnicity (Lane et al, 2008).

The location of supermarkets is also important because many residents in low income areas do not have access to private transportation and therefore rely heavily on mass transit or walk to their destinations (Algert et al, 2006). People will often shop for food at the most convenient location, which is often the store nearest to them. This is important because researchers found that women who shop at supermarkets consume more fruits and vegetables than those shopping at other types of stores (Zenk et al., 2005). Analysis of supermarkets and other types of stores show that these other stores tend to have lower quality and a smaller selection of fresh produce (Zenk et al, 2005). For many residents of low income neighborhoods, the most convenient location to buy food is often a corner store or gas station that is within walking distance (Algert et al, 2006). As a result most of their food is purchased at a store with limited supplies of healthy food choices and poor quality if any fresh produce. This may explain the relationship between supermarket availability and health. It may simply be that low income residents make unhealthy food choices because healthier food is not readily available.

In addition to location, another important factor in healthy food consumption is cost. This is important because the cost of food in relation to its energy density plays a major role in which foods are purchased. Energy dense foods provide high dietary energy per unit weight (Drewinski, 2004). Energy dense foods are often very cheap and readily available in low income neighborhoods (Drewinski, 2004). Unfortunately, energy dense foods often contain added sugars, refined grains and fat (Drewinski, 2004). When compared to healthier options such as fruits, vegetables and lean meats, the difference in energy cost may differ by as much as a factor of several hundred (Drewinski, 2004). As a result when low income residents make choices based on cost and energy availability they inadvertently make unhealthy choices. A diet made up of mostly energy dense food and little fresh produce can lead to obesity and associated health concerns (Drewinski, 2004). It is important that the economics of food choices be considered in addition to other factors when trying to address health concerns connected to dietary choice.

Barriers to consumption

Many studies have identified the barriers to consumption of healthy food choices. Understanding these barriers is important because consumption of healthy food will not increase until these barriers are removed. One of the most important barriers to the consumption of healthy foods is access to supermarkets and fresh produce (Schultz et al, 2005). Other barriers include funding priorities, knowledge, educational level and self efficacy (Havas et al, 1998; Schultz et al, 2005). The perceived barriers to consumption are also an important determining factor (Steptoe et al, 2003). It is important to understand what the community members perceive as barriers to their consumption of fresh foods. This is because more perceived barriers lead to lower intake of fresh fruits and vegetables (Havas et al., 1998). Before embarking on any

programs increase consumption, the existing barriers as well as the perceived barriers must first be identified. This can be done through surveys and community meetings.

Once the barriers are identified programs need to be initiated to address the removal of barriers to consumption (Steptoe et al, 2003). There are many ways to remove these barriers. Several different approaches have been attempted. Havas et al. (1998) advise educational programs. Drewinski (2004) propose increasing access to affordable alternatives to cheap unhealthy food. Herman (2006) suggests providing low income populations with economic supplements specifically for purchasing fresh produce. Kristal (2000) recommends increasing social support and positive environmental factors. Zenk et al (2005) suggest the development of supermarkets and specialty stores. Studies assessing these and other approaches found that the best approach to fresh food availability is one that uses a combination of the aforementioned approaches in a comprehensive food plan (Havas et al, 1998; Pothukuchi, 2005; Schulz et al, 2005; Zenk et al, 2005).

The case for a comprehensive food plan

The most effective way of increasing fresh produce consumption in an economically viable manner is through the development of a comprehensive food plan. This plan will address food availability through a variety of initiatives that complement each other. These initiatives will address the many facets of food availability and health. I propose that the East Tampa food plan have three main initiatives. The first is to strategically increase the number of supermarkets. The second is to increase educational programs that promote fresh produce as part of a healthy diet. The third is to support diverse sources of healthy food. Together these three strategies can address most of the barriers to healthy food consumption.

The success of a comprehensive food plan rests on several determining factors. One of these is the involvement of the community. Another factor critical to the success of the comprehensive food plan is the creation of supporting policies. Planners and community leaders have to be willing to introduce policies that support the comprehensive food plan. Also important is the wise use of resources. East Tampa is a strong community with many resources. These resources, properly utilized, can ensure the success of the comprehensive food plan. An important part of the comprehensive food plan is an analysis of the available resources. It should be the first step in developing the plan. This will allow community leaders and policy makers to understand the resources at their disposal and ensure that these resources are used efficiently. It will also let them know how much actually needs to be done to increase availability of fresh produce. For example, in this stage community leaders would determine where persons currently shop for food and how much fresh produce is available at these locations. They may find that people buy food at locally owned business in close proximity to their house and that these stores do not carry fresh produce. The simple solution may be to create programs that encourage these stores to begin carrying healthy produce. An analysis of other areas in the community can lead to other solutions that best fit the needs of East Tampa.

Strategic supermarkets

Supermarkets in urban areas should be developed to meet the specific needs of the community. East Tampa needs more supermarkets to increase the healthy food choices available to the community. Urban areas have a lot of spending power that remains largely untapped (Initiative, 2002). In recent times companies are waking up to this reality and have begun moving away from the tough competition of the suburbs to the untapped potential of the inner cities (Initiative, 2002). This however, should be done carefully, as the traditional model of the

suburban supermarket often is not successful in urban communities. First there can be concerns from the community that when large chains move in they threaten the livelihood of independent grocers (Initiative, 2002). This can be addressed by emphasizing the positive impacts of the supermarket such as providing needed services and workforce development as well as through community involvement and partnering with community based organizations (Initiative, 2002).

Some supermarkets have used innovative approaches to ensure their success in urban markets. One example is Schnucks supermarkets in low income neighborhoods in St Louis. To reduce costs its city stores are much smaller than suburb stores and have low height shelves in many departments (Initiative, 2002). To reduce security costs it modeled its security measures after Pathmark in Newark, NJ (Initiative, 2002). Other supermarkets used targeted marketing and stock their shelves with ethnic products that their customers use on a regular basis (Initiative, 2002).

One resource that is important to East Tampa is the presence of brownfields and its associated tax credits. In addition to the large spending power and limited competition, these can be used to attract supermarkets to East Tampa. Further, supermarkets can generate more revenue by building multi-level, mixed use buildings. One such building can house a supermarket on the first floor and a gym and day care center on the second floor. Attracting supermarkets to East Tampa is a critical component of the comprehensive food plan. If planners realize that supermarkets can improve the overall quality of life in a neighborhood they will create policies that make their ensure supermarkets are attracted to their communities.

Education

Effective educational programs are very important to the success of a comprehensive food plan. They help remove a lot of the perceived barriers to consumption of fresh produce.

East Tampa can use some of its community based organizations such as churches and CDCs. Havas (1998) suggests that educational programs should use simple concrete messages like consume 5 or more cups of fruits and vegetables a day. The community organizations and churches can be used to promote these messages. They can also be instrumental in developing messages and programs that will best suit the needs of residents of the community because of their close ties with the community. This also ensures that participation of the community.

Another way that the community can be involved is through the use of programs that use social modeling (Havas et al., 1998). There are many national groups that help with such programs (Duggan, 2004). These national groups assist local community leaders in by providing support and resources to ensure the success of local educational programs (CFSC, 2008). These can be programs that demonstrate for techniques for preparing fruits and vegetables and provide opportunities for hands on practice (Havas et al, 1998). They may be cooking demonstrations in schools and churches. The demonstrations may also be held in other locations around East Tampa such as schools, churches and other community groups. Furthermore, programs such as these that include community residents are important in providing a foundation for broader social movements to address fundamental factors that produce disparities in health (Schulz et al., 2005)

Diversified sources

In addition to increased supermarkets and educational programs, fresh produce availability can also be addressed through programs aimed at creating diverse sources of fresh produce for the community. These range from programs such as farmers markets and community gardens that tap into local sources of produce to programs that encourage existing corner stores to increase their selection of fresh foods. In Troy, NY the state funds a mobile market, called the veggie mobile, that delivers food residents in underserved areas (Kenning,

2008). The veggie mobile offers healthy food choices at affordable prices (The Associated Press, 2008). Another interesting initiative that can be adapted to East Tampa comes from Philadelphia. There, special funding was used to obtain refrigerators for corner stores to carry more fresh produce (Kenning, 2008). In other places the owners of corner stores came together and pledged to replace some of their unhealthy food choices with healthier options. In Hartford, CT this is part of the Hartford food system (Hartford, undated). This system includes several smaller initiatives such as urban mini-farms, farmer's markets, grocery delivery to seniors, improved transportation to grocery stores, financing for new store development and regular food price surveys (Hartford, 2008). These seemingly small initiatives are very important to the success of a comprehensive food plan because they fill in the gaps left by larger supermarkets and encourage community involvement.

Another important asset to a community's healthy food program is the presence of specialty stores. These stores are different from supermarkets because although they offer regular grocery items at prices comparative to other supermarkets, their main focus is specialty items such as organic and natural foods (Natural, 2008). Many large chain stores are opening smaller value oriented specialty stores in underserved urban areas (Progressive Grocer, 2008). Some of these stores are Urban Fresh by Jewel, Safeway's The Market, and Marketside by Walmart (Supermarket 2008; Natural, 2008). Planners in East Tampa should try to attract specialty food stores as part of the comprehensive food plan. Together with other diversified sources of healthy dietary options they can form the cornerstone for a plan that ultimately leads to a healthier East Tampa.

Conclusion

Dietary choices are inextricably linked to health. There are many factors that affect dietary choices. Among these, fresh food availability is one of the most important factors contributing to dietary choice. In the United States, many low income urban neighborhoods do not have adequate access to supermarkets and grocery stores to affordable healthy food. This results in poor dietary choices and a prevalence of chronic illness and poor health. One approach to solving this problem is through the implementation of a comprehensive food plan. This plan will address three main aspects of food availability. First the plan will increase the number of full service supermarkets. Also, the plan will institute and support educational programs that encourage healthy dietary choices. Finally, the plan will strengthen food access by supporting a variety of diverse food stores. Given the resources available in East Tampa, a comprehensive food plan could be very effective in addressing food availability and its associated health issues. By increasing healthy food choices East Tampa can decrease chronic illness and foster a healthier more vibrant population.

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A case for an East Tampa Greenway

by
Nathan G. Miller

Introduction

On September 18, 2008 a community meeting was held in East Tampa to discuss brownfields within the community and their links to health and the environment. The overwhelming consensus of the attendees was that community health among people of all ages was a definite concern. Obesity, diabetes, asthma, and high cholesterol were issues of major concern among all involved. On the environmental front the deterioration of the community's green spaces also arose as an area of concern. While it may appear on the surface that these problems are unrelated a very good case can be made for just the opposite. I believe that both issues are intertwined and reclaiming the green spaces will go a long ways towards reclaiming the health of the residents.

Beginning in the 1840's a park movement swept through the nation, grounded in the romantic beliefs of tranquility and restoration for the soul brought on by natural scenery (Low, et al, 2005). The proven benefits of green spaces in urban landscapes have since come to include the physical for human users and the aesthetic for surrounding areas. These physical and mental benefits were documented as early as 1910 in Chicago's park system (Taylor, 1910) and current surveys reveal they continue to this day. Urban parks have even been recognized for their ability to improve social interaction among people of all backgrounds (Seeland, et al, 2008). More easily recognized is a park's ability to add to the beautification of a neighborhood and even bring a bit of genteelness.

In 2007 The Center for Disease Control (CDC) listed 38% of Florida residents as overweight and an additional 24% as obese. The CDC is very clear about contributing factors to obesity; "Communities, homes, and workplaces can all influence people's health decisions. Because of this influence, it is important to create environments in these locations that make it

easier to engage in physical activity and to eat a healthy diet” (Center for Disease Control, 2008). Furthermore, the CDC points out that physical activity need not be strenuous to have beneficial effects on other health risks such as diabetes and high blood pressure (Center for Disease Control, 2008).

The city of Tampa lists 146 parks on its parks search webpage and a quick search shows approximately 10 parks are within the East Tampa area. However, not one of those parks lists a trail as an amenity. This is reflected in a 2008 study conducted on park usage in Tampa and Chicago which showed 70% of Tampa park users were observed in sedentary activities, compared to 21% involved in walking (Floyd, 2008).

In February of 2001 a Tampa Greenways and Trails Master Plan was adopted, stating that “Florida and its major cities have long been on the cutting edge of developing and providing its citizenry with a system of greenways that link natural areas, open spaces and cultural amenities” (City of Tampa, 2001, pg 3). In addition, the planned greenway system of Tampa is intended to offer recreational venues for users of all varieties, including walkers, hikers, skaters, bicyclists, and canoeists (City of Tampa, 2001). A greenway system such as this through East Tampa would be an ideal step towards providing more physical activities for the residents, bringing the community together through social interaction, and revamping the face of the neighborhood. Sadly however, while many of the other areas of Tampa are included in the original and amended plans, East Tampa is not.

I believe that East Tampa is the perfect example of a community that would benefit greatly from a greenway connecting its existing parks as well as new parks that can easily be carved out of existing brownfields. The area is undergoing a period of great redevelopment and the deterioration of community, environmental injustice, and improvement of trailways are among the biggest challenges facing this effort. Building a greenway would not only address

these concerns, but would also add an alternative transportation route, improve property values, and go a long way in improving the overall health of the residents.

Benefits

Health

Public health is of great concern for any city. Beyond the social obligations of protecting its citizens, maintaining their health is one of the biggest expenditures of a city's annual budget. One of the tenets of healthcare is that preventative care is always much easier to provide and less expensive in the long-run than attempting to address a problem after it has taken hold. It is in this tradition that for decades cities have sought to provide green spaces within their urban settings.

As mentioned in the introduction, the greatest concern of the citizen focus group held in East Tampa was the health of the community. While much of the concern was for adequate access to health care for prevalent ailments, there is a silver lining present. Many of these problems can be prevented with simple measures. The American Diabetes Association has found that physical activity for just 30 minutes a day combined with a 5-10% reduction in body weight can produce a 58% reduction in diabetes (American Diabetes Association, 2008). The National Heart Lung and Blood Institute finds that this same 30 minutes a day of moderate physical activity is a key step in preventing and controlling high blood pressure (National Heart Lung and Blood Institute, 2008). The Center for Disease Control lists providing opportunities for physical activity in the community and building physical activity into your daily routine as two important ways of preventing obesity (Center for Disease Control, 2008).

A study conducted in 2001 correlated body mass index (BMI), the common measure of obesity in people, and environmental features which supported physical activity. In this study

persons who were physically active were 3.6 times more likely to be normal to underweight than those who were physically inactive. Persons who were regular walkers were 2.2 times more likely to be normal to underweight than non-walkers. Additionally, persons who reported using walking trails were 3.1 times more likely to be regularly active versus inactive, and the presence of recreational facilities and use of walking trails resulted in twice the odds of being overweight as opposed to obese. Overall, the authors of this study found that their results agreed with previous work that showed having walking paths and recreation centers available correlated to variations in BMI (Wilson, et al, 2007).

These results bode well for communities who have access to plenty of parks and especially trails. However, as I mentioned in my introduction only ten of Tampa's 146 parks are in the East Tampa area, and none lists trails as an amenity. Those present appear to be designed first and foremost for the benefit of youth, with recreational centers, playgrounds, and after-school programs as their main draw. While these are admirable goals and certainly need to be present in a community, the pursuit of physical activity needs to be carried through to adulthood and encouraged for those of all ages. Statistics such as those listed above attest to the effects if it is, and what happens if it's lacking. The study mentioned in the introduction about park usage in Tampa points out that 70% of users were involved in sedentary activities. Of the over 7000 park users in ten parks studied in Tampa, 8% were participating in vigorous activities and 21% were walking. It goes on to reveal that while 66% of users were adults compared to 34% children, only 23% of the adults were engaged in walking or vigorous activity (Floyd, 2008).

The health benefits even extend to such simple affects as lessening stress and headaches among park users. A study of park users in Zurich, Switzerland revealed that headache levels dropped 52%, overall stress recovery rate was 87%, and a 40% improvement was seen in the

respondent's feeling of being well-balanced. Almost 70% of these users rated walking in the park as their primary recommended way to relieve stress (Hug, et al, 2007).

Health care that begins with prevention and maintaining an active lifestyle is promoted by health professionals as the best preventative care in the fight against numerous diseases and ailments. But as demonstrated over and over by studies and surveys, an active lifestyle often depends on ready access to facilities that encourage vigorous activities. Urban spaces are especially in danger of crowding out places in which to enjoy outdoor activities, and merely planning parks in urban spaces can often present a façade of a robust outdoor lifestyle. Greenways are excellent methods of ensuring that city parks are not simply living rooms, in which sedentary activities merely have a grass carpet instead of hardwood floors. East Tampa, with 58% of its population in the active adult age range of 18-64, can provide that active, health-conscious lifestyle for its residents with a greenway that loops through the neighborhoods and connects the park system.

Aesthetics

While having access to outdoor space for activities such as walking or biking is important in getting people out of their house and exercising, the key is making sure the outdoor space is cosmetically attractive and safe. An Australian study found that an aesthetically pleasant trail as well as a convenient one significantly improved the likelihood of walking (Ball et al, 2001). For the older population in a community, walking is often not only the preferred method of exercise but transportation as well. Another study, this time of citizens in the Netherlands over the age of 55, shows that three main factors determine the attractiveness of walking routes: cleanliness of the street, scenic value, and the presence of other walkers (Borst, et al, 2008). The report that previously mentioned linking walking habits and Body Mass Index also shows that people living

in what they perceive as a pleasant neighborhood are 1.9 times more likely to be regularly active versus inactive (Wilson, 2007).

East Tampa has over 10,200 households and boasts a 61% home ownership rate (East Tampa Development, 2008). It's an easy assumption that having green space near a home increases its property value, but empirical evidence can easily be found to back up this assertion. One study in Dallas indicated that homes facing parks have 22% greater value than comparable homes over one half mile from the same park (Miller, 2001). In Austin, two neighborhoods facing greenways showed noteworthy increases in property value for those homes directly adjacent to it (Nicholls, 2002). An additional study showed that not only do adjacent green spaces increase the value of single-family homes, but an even more significant increase is seen with narrow green spaces, such as greenways (Hobden, 2004). The total increase in property value resulting from proximity to green spaces, and the benefit to the city resulting from increased property taxes must also not go unnoted.

One final point I will mention is that the city of Tampa published a report of the tree canopy in the city limits in 2006-2007. Two staggering statistics stand out – parks only cover approximately 1.3% of the land in the city, and on that 1.3%, only 31% has tree canopy (Landry, et al, 2008). Establishing more parks means assuring that not only will more land be set aside for recreation but more tree canopy will remain untouched by development. And as pointed out above, a more attractive outdoor surrounding means a more active citizenry.

Community Connection

As I toured the East Tampa area I noticed the quotes engraved on sidewalks throughout the neighborhoods. Lorna Alston with East Tampa Development explained it way of weaving a common thread through the streets, thus encouraging a sense of community. I believe this is a very important part of maintaining a sense of togetherness among neighbors, which in turn can

lead to decreased crime, increased camaraderie, and numerous other benefits for the area. I also firmly believe a greenway would be another method of connecting the people, helping to create this sense of community.

Growing roots in a place often begins in youth. I pointed out previously that children account for 34% of park users, and the play they participate in not only begins their socialization process but engrains in them a love for the community they grow up in. People raised to participate in their community while growing up will often involve themselves in community endeavors as adults. Additionally, oftentimes when a new family moves into a neighborhood their introduction to their neighbors is through youth events such as sports in local parks. The importance of parks in socialization, of youths as well as adults, goes beyond anecdotal evidence. Seeland, et al. (2007) noted in their study that 43% of youths surveyed pointed to outdoor environments such as parks as a place they could easily make friends, more than double the percentage of the next most frequent answer. Very simply, the authors found that outdoor green spaces were the most prominent places for youth to meet and enjoy exchanges.

Transportation

The last case that can be made for an East Tampa Greenway could also possibly be its strongest. With the rising cost of fuel, the increasing sprawl of cities, and a call from new urbanists to combat sprawl by increasing population density in city cores, greenways can provide not only a form of exercise and socialization, but a form of low impact transportation as well. If neighborhood sidewalks and bike lanes are in disrepair and meagerly interspersed, and the scenery bleak and uninviting, residents will often feel no alternative but to use their automobile for transportation. A greenway would connect bike lanes and walking paths that may be present but scattered throughout the area. It would clean up and improve lots and right of ways which may now be overgrown and impassable.

A Canadian study (Craig, et al, 2002) found that walking to work was significantly related to the neighborhood environment, and renews the call for integrating residential neighborhoods with stores, schools, and workplaces. This is precisely the goal of the East Tampa Development program, so a greenway would appear to be the next logical step.

Just as important are the city-wide transportation plans for the future. The Hillsborough County Transit Concept for 2050, published in 2007, lists among its key features “alternative mobility options within congested corridors” and the promotion of “walkable mixed use neighborhoods.” The idea of creating sustainable transportation options is the focus, with making walking and transit more “viable and desirable” options (Hillsborough County Metropolitan Planning Organization, 2007). The plan is ambitious and admirable for its inclusion of bus and rail systems which seek to serve as much of the county as possible.

However I believe there is a neighborhood transportation issue that is ignored by this plan. Riders of the bus and rail systems must get to the stations somehow, and this is where a greenway could fill in the gap in true door to door transportation. Why not encourage commuters to bike and walk to their local rail station instead of drive their car? This would truly cut down on the amount of traffic on the roads and the city’s carbon footprint. Under the latest available master plan there are limited bike path improvements planned for East Tampa but unfortunately no greenway developments are included. Luckily, this is easily remedied by building an East Tampa Greenway which would enable the residents to commute from their front door to anywhere in the city without turning on their car. It would also improve the capability to bring in workers and shoppers from other areas of the city, as well as improve property values even more with the easy access to county-wide transportation.

Envisioning an East Tampa Greenway

Before describing the would-be East Tampa Greenway, it would be good to examine a few real-life greenways in other cities. At nearly 14 miles in length, the Sand Creek Regional Greenway in the northeast metro Denver area is a combination of soft-surface trails mixed with concrete surfaces which compose part of a 50 mile loop of urban trails through Denver. It is an oasis for wildlife amidst the urban setting and is used by bicyclists, walkers, runners, horseback riders, and even pets on leashes. No irrigation occurs, nor will you find any traditional city parks, just natural vegetation (Sand Creek Regional Greenway, 2008).

The Midtown Greenway makes its way nearly six miles through Minneapolis, Minnesota. It is a bike and walking path repurposed from an old railroad corridor, grade-separated from the street, offering no-hassle bicycling that traverses across town faster than auto traffic. Long term plans for the corridor include building an express rail transit service operating alongside the trails, thus becoming an integral part of a regional rail transit system. Interestingly enough, the Midtown Greenway Coalition feels that,

No transportation infrastructure is complete without destinations and the Midtown Greenway is of no exception. With the completion of the trails across Minneapolis the Greenway has become much more visible and has caught the eye of many developers who want to build along it. An important part of the answer involves the setting aside of adjacent lands suitable for public open space. They offer activity destinations, improve access to and safety of the Greenway, and provide opportunities for demonstrating and managing good ecological design with sustainable plant communities and storm water management. (Midtown Greenway Coalition, 2008).

The following is a description of another city's greenway system. The system is defined as "a network of paved walking, jogging, skating, and biking paths that will eventually stretch all across the city and through many of its neighborhoods. The benefits of trails include fostering

personal health, strengthening community values, preventing crime, protecting the environment, and contributing to a healthy economy”. The greenways being described here are those of our own city, Tampa. The city appears to already value greenways and the benefits they bestow upon a community. Now it just needs to be convinced that East Tampa would benefit from a greenway.

Let us envision the parks located within East Tampa, connected by a well-taken care of, planned trail that curves throughout the community. The path, instead of being a simple bike lane along a busy street, is a dedicated corridor wide enough to accommodate bikers and runners as well as couples out for an evening stroll. At times following along the city streets, it adds a bit of a genteel feeling to a formerly bleak, urban landscape. Other times it turns away from the streets to make its way through forested lots and open spaces, former brownfields now cleaned up, to bring a sense of escapism and serenity to the user. The East Tampa Greenway could make its way along the proposed bus and light rail stations and provide a safe and relaxing way home for people commuting from downtown to their house for dinner. The native landscaping would require little to no irrigation or maintenance and would provide a respite for the wild birds and animals that currently make their home in unkempt junkyards and resident’s backyards. This is a greenway that would truly fit the description promoted by the city above and follow in the tradition of other outstanding greenways across the country.

Conclusion

The city of Tampa has laid out before it an impressive plan for its future. Massive local and regional transit systems, and greenways and blueways, are part of that plan. The Tampa Greenways Master Plan lists identifying off-road multiuse trail opportunities as one of its goals.

In the description of greenways the plan states that off-road segments “should also provide space for the addition of trees, landscape buffers and recovery zones...Lastly, narrow hiking trails may compliment and extend the network in areas where the protection of environmentally sensitive land is paramount...” (City of Tampa, 2001, pg 28). The city has obviously devoted much thought to the design of future greenways, and I applaud the models they are striving towards. Now it is time those standards are met in the East Tampa area.

If they were met and an East Tampa Greenway was in put place, the benefits brought upon this community would be endless. East Tampa residents would be able to move around their neighborhoods with much more ease and with a sense of community pride and satisfaction in the beautification the trail would entail. Pedestrians would feel safer walking to work or to a friend’s house, and in the evenings could enjoy the serenity of the secluded portions of the trail as they got out of their houses and followed their doctor’s advice to get more exercise. Home owners would see the value of their investment rise and business owners would quickly see the benefit of locating in an area where pedestrians are constantly out and about.

For these reasons I am proposing that East Tampa Development actively seek out inclusion in the city’s park plans for the future via a true greenway, not just bike lanes added into busy roads. In addition I propose that some of the current brownfields in the neighborhood be given over to this effort. A unique greenway winding its way through the community’s streets, parks, and open green spaces would be more than just a benefit for transportation and health. It would be the thread connecting the community which is the ultimate goal of the East Tampa Development effort.

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**Developing Sustainable Greenspace in the East Tampa
Community Through the Renovation of Retention Ponds
and Creation of Parks**

By
Andrew R. Gatewood

Introduction

The concentration of brownfields in the East Tampa communities presents an excellent opportunity for community development. In many communities space is at a premium and the creation of parks and greenspace can be extremely difficult considering that most of the land is being occupied. However, in East Tampa many of the estimated 760 brownfields are on vacant lands that can be easily transformed into some the community can regularly enjoy. The creating parks and renovating retention pond areas allow for the easy transformation from an area rarely used to one that is a focal point of the community. Many of these new parks will have the ability to use green technologies that will drastically reduce routine maintenance as well as the long term cost. These types of projects can provide the community with a very simple and cost effective option to convert many of the brownfields in the area and provide jobs to the local residents.

Greenspace

The use of stormwater retention systems in Florida is essential in reducing and possibly preventing flooding in the area it covers (Florida Department of Environment Protection, 2008). The East Tampa area has many retention ponds throughout the communities; the residents that live around them view some negatively. Several studies have been conducted around the United States looking at residents' view of their community's greenspace. The studies show that areas such as retention ponds are viewed negatively (Schroeder et al, 2004). However, that same pond when turned into a park setting can become a focal point and a place frequented by the residents (Schroeder et al, 2004). These newly renovated areas need careful management. In addition,

using more sustainable and green technologies can reduce the upkeep needed on these sites (Sugiyama et al, 2008).

Retention ponds can be a viable habitat for native species that live around the East Tampa area. Species of special concern such as Sand Hill Cranes (*Grus Canadensis*) Roseate Spoonbill (*Plataleaajaja*) and the Wood Stork (*Mycteria Americana*) regularly use retention ponds as a habitat and a feeding ground. With the reduction of habitat and the encroaching sprawl of development these areas become oases for endangered and rare species (Jordan, 2001). Retention ponds can be planted with native species that not only provide habitat for endangered species but also infuse an aesthetic value that the residents can regularly enjoy when using the area for recreational purposes. The main focus should during this habitat creation should be the successful establishment of a littoral shelf in these retention ponds, because it ties habitat creation, recreational use, and aesthetic value together allowing for a retention pond to reach its peak capacity.

The Littoral Shelf

A littoral shelf is the area of a retention pond designed to become shallow at an end so that nutrient assimilation can be conducted by vegetation (University of Florida, 2008). There are many important aspects to understand the complexity of the littoral shelf. A littoral shelf is very important to a successful retention pond. These include (or these are) provide a habitat for plant and animal species in the area, assimilate nutrients through the vascular structure of the littoral shelf vegetation, decrease turbidity during high rain events, and provide aesthetic value to the community. Each of these functions correlates with the other to form an intricate system unique to this type of stormwater management.

The littoral shelf creates habitat that is used by fish, snakes, turtles, alligators, wading birds, otters, and many upland mammals that use the pond as a source of drinking water (Florida Fish and Wildlife, 2008). The plants that usually populate a littoral shelf include Cattails (*Typha* sp.) Pickerel Weed (*Pontederia cordata*) and Duck Potato (*Sagittaria latifolia*). Researchers believe that the vascular structure of these plants separate them from other plants that may be able to populate a littoral shelf (University of Florida, 2008). They provide cover for the predator and prey species listed above as well as an aesthetic value when in bloom. These plants are exceptional at absorbing nutrients that saturate the pond during high rain events as well as reducing the turbidity by slowing the flow of water through the area.

During rain events the intake of stormwater runoff is usually concentrated with nitrogen and phosphorous from yard fertilizers. These chemicals can cause algal blooms if not absorbed quickly once they enter the water. These algal blooms decrease the dissolved oxygen (DO) in a pond, which kills the fish leading to the decrease of biological and ecological productivity (Silva et al, 2006). Most ponds are designed in a way that the intake is at one end of the pond and the littoral shelf and outfall is at the other end. This design allows the sediments that are suspended in the water causing turbid condition to fall out of suspension and fall to the ponds floor. The littoral shelf slows the water allowing suspended sediments to settle (Jones et al, 2006). The littoral shelf is very important in establishing a successful retention pond ecosystem.

Retention ponds can also provide many recreational activities such as fishing, photography opportunities, and an aesthetic value found while jogging or walking (Barr Engineering, 2004). Once a littoral shelf has been established these ponds can be stocked with baitfish such as shad or brim that will provide food for larger fish such as bass and catfish. Pond management fish such as triploid grass carp will keep algal blooms in check so that the area can

regularly be fished. These methods will provide years of successful fishing for the local communities and can provide activities for after school groups, church outings, and picnics.

Many photographers like to film wildlife in a natural setting, and retention ponds provide a close to home ecosystem that will be inhabited by wading birds, alligators and turtles as well as flowering plants (Elmendorf et al, 2005). The opportunity to be in a relaxed setting and take pictures of the environment close to home is a great benefit to photographers. This also provides an opportunity for school groups to show their artistic abilities without having to travel that far from school.

These same concepts used on retention pond renovations can be applied to the renovation of brownfields by turning these areas into gardens and parks. Many of these areas could be turned into native flower gardens or urban forestry projects that will provide valuable greenspace that is so scarce today in East Tampa (Hansmann et al, 2007). These types of ecosystem creation projects can provide habitat for Gopher Tortoise (*Gopherus polyphemus*), a species of special concern in Florida. The larger the brownfield or retention pond area, the larger the amount of habitat this is being created that can be used by these species as well as the community's residents.

Florida Scaping, the use of native plant and tree species to reduce the need for upkeep and watering, will further reduce the complications that brownfield renovation encounter. Appendix 1 contains a list of recommended plant and tree species that could be used in East Tampa for upland and wetland greenspace or retention pond sites from (Appendix 1.) (Florida Native Plant Society, 2008). This type of landscaping is beneficial because native plants are more acclimated to the area and will need less care than non-native plants that require constant care and watering (Ferrini et al 2004). This reduces the need for further monetary involvement

from the East Tampa community and reduces the overall cost of this type of pond renovation project (McPherson, 2000).

Green Technologies

Pond renovation projects regularly use concepts from innovative new green technologies. These include rain barrels, reclaimed water, pervious pavements, solar lighting, and nutrient assimilation through littoral shelves. By using green technologies, not only does this project reduce the overall cost but it also reduces the upkeep and long-term maintenance (Nielson et al, 2007). These sustainable theories can be used to bring economic principles and ecological principles together for the benefit of the East Tampa Community.

These projects, such as the retention pond renovation, can utilize solar lighting along the trails and walkways created around them. This renewable resource is ideal for the East Tampa Community because of the number of sunny days the area has. This energy source will keep the overall cost and maintenance at a minimum for the project sites. There is no cost for trenching wires, monthly electric costs, maintenance, or wiring (solarlighting.com, 2008). These lighting systems can last well over 30,000 hours on a battery charge and can be charged quickly during sunny days. The only recommended maintenance is to wipe off the solar panels with a wet cloth if heavy dirt or dust accumulates on it. With this type of low upkeep system implemented on these renovation projects the community will save money on the first night.

The trails and walkways that can be installed for the residents to walk on can also benefit from a type of green technology. The use of pervious pavements on the walkways, trails, and parking lots will reduce the need for stormwater management systems and also reduce the chances of flooding (Ohio Ready Mixed Concrete Association, 2007). The extreme heat in

Florida causes the oils to rise up through regular asphalt and during rain events in the summer months. This oil runs off into stormwater ponds where it directly affects the local ecology (Duluth Stormwater Department, 2008). Pervious pavements are extremely hardy in intense heat or cold and many do not use any oils, which will eventually runoff into the local stormwater ponds or groundwater (Wanielista et al, 2007). Pervious pavements can also be less costly than regular pavements especially when the long term use and cost of upkeep is considered (National Ready Mixed Concrete, 2008). The use of pervious pavements have much of the same benefits as solar lighting in that is ideal for the climate, low cost for installation, low cost for upkeep, and has durability. It will also reduce the need for stormwater management systems, which may reduce the costs associated with permitting from the local regulatory agencies and consultant cost. There also may be tax breaks for using these types of technologies, which would also be very beneficial for the East Tampa community.

The use of water can also be reduced through several methods. One already mentioned is using native plants that are adapted to the growing conditions and will require less upkeep than non-native plants (Weisman et al, 2005). The use of reclaimed water can be another alternative to using public water at these greenspace projects. Many metropolitan areas have a surplus of reclaimed water and very few sources to use it at. There also could be possible tax breaks or funding in getting the waterlines to pump reclaimed water t these project sites (Jones et al, 2006). The surplus of reclaimed water means that there are very few water restrictions even in drought conditions.

The use of rain barrels and other collection systems can be applied at each park area and can be used to water that specific area. These water collection systems can usually be made extremely cheaply or may even be provided free of cost by the city. These systems can be then hooked up to a slow drip pipe system that can evenly water the entire park at a very low cost

(Brydon 2004). At The retention pond project sites a water pump can be installed which will pump the stormwater from the pond into a sprinkler system that can water the surrounding landscaping. Both the pump and the sprinkler can be solar powered further reducing the cost and making these sites completely self sufficient and sustainable.

Job Creation

In addition to the aforementioned benefits, The East Tampa Community can also benefit from these because they have the potential to create jobs for the community as well. In addition, the residents could coordinate these projects to instill a sense of pride in the community (Elmendorf et al, 2005). The community should be involved in throughout the entire project duration. This includes the planning and development, site selection, and budget for each project.

Another benefit of these retention projects and greenspace/park creation could possibly create the need for rangers or managers that can assist the residents who have questions about the areas local flora and fauna or up coming events and activities. These activities could also create a need for a recreational coordinator that could over see several of these sites and coordinate with other coordinators and organize health days, or farm markets. The areas could also have a biologist that could manage the wildlife using these sites or grounds keepers that perform any needed upkeep for the entire community's park system.

The creation of jobs in the community will help the local economy, instill community pride, and keep the community leaders informed on how the public opinion of this type of project is perceived. It will allow leaders to be informed enough to know if more of these projects are desired for future construction projects. Having jobs created in the community will

also keep money in the East Tampa Community's local economy. The importance will continue to be felt as more jobs are created.

The need for these projects should be researched through community outreach. Community meetings or house-to-house surveys may provide an insight to see if the community would benefit and use these areas or if the money could be better spent in other ways. The surveys or town meetings should detail the cost associated as well as the benefits so that the community can fully understand all aspects of this type of community design project. This will also help get the community involved quicker and help develop the sense of pride discussed earlier in the essay.

Conclusion

The East Tampa Community has some ideal situations for these types of greenspace creation projects proposed in this essay. Many of the green technologies can be applied to the proposed projects' and be successful beyond application. These projects help the community in several ways, one providing jobs to the economy, which could help the local community as well. They can also provide habitat for endangered and species of special concern which the community can then observe in their neighborhoods in a safe situation for both society and nature. It can also provide a sense of community pride and aesthetic value that the residents can enjoy while walking through their community. All of these are very important and should be considered during the implementation of any of these ideas mentioned above.

The potential for tax breaks by using solar technologies, pervious pavements, and rain barrels and other collection devices and using reclaimed water may be readily available and should research further. Any reduction in startup cost of these projects allows for the ability to

create more greenspace than first thought. The financial management and budgeting process should be fully researched before beginning any of these projects to reduce cost in any way possible.

The reduction of the East Tampa community's brownfields may be a costly task, however if these type of project are implemented many of those cost could be avoided and the project should require less construction time, which will bring them online quicker than many other projects. This quick conversion from brownfield to park will show the community that this type of community design is going to be a serious and organized effort with real results quickly. This type of productivity will bring much more community involvement, which can lead to more ideas about future projects as well as the success of completed projects.

This is a special community with a special situation for community development and betterment, many ideas will be presented and all should be researched before any activity is begun. This will ensure the community above all else will benefit from this situation they have been presented with. All of the ideas proposed in this essay still need to have an in depth cost analysis conducted for a full report on how much cost will be required for these renovation and creation projects to be completed successfully to have the results proposed earlier. With a well-rounded budget proposal and sincere construction effort the results should be very beneficial for the East Tampa Community for year to come and be available to all the members of this community as well as the surrounding Tampa communities that will start or continue to frequent the East Tampa Area.

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Turning Brownfields into Art Parks

by
Ryan Rankin

Introduction

Brownfields are a part of every community. The processes by which these sites have deteriorated to a state that requires revitalization in order to be developed are also similar nationally. Both federal and local governments have gone far beyond acknowledging the problem with these sites, and programs (such as the EPA's Superfund) have been created to combat the brownfield problem. However, much of the funds allocated for this redevelopment are intended for sites that have been severely degraded by prior industrial use. These sites traditionally are located in large cities, not smaller communities such as East Tampa. The definition of the brownfield site in the US is still focused primarily on these larger sites, and less focus is placed on sites that may not offer as much economic redevelopment potential (EPA.gov). Now more attention is being given to these smaller "eye-sore" sites that may not be a health risk (due to contamination) or may not be large enough for a Super Wal-Mart, but can be harmful to community pride, image, and quality of life for residents. East Tampa is a very good example of how a large number of these smaller sites can accumulate to a point where an outside investor considering development may question his/her decision based on what may look like an area that is not economically sustainable for a new business venture.

That leads to a discussion of what to do with brownfield sites in an area like East Tampa. Should more focus be placed on turning these sites into clean, green spaces that lend themselves to a better quality of life for residents, or is it better for these sites to be purchased by developers who plan on cleaning the site and building a business on it? In the end, both are necessary. By turning some of these sites into attractive green spaces, the image is instilled that the community cares about its land, and community morale is high, which leads to a more healthy economic community. On the other hand, it is also important for possible developers to see that other businesses have been successful in developing on a prior brownfield site.

I propose to plan and develop one of the brownfield sites in East Tampa into a public green space with a permanent piece of public art displayed. My hopes are that this structure will capture the essence of the community in which it is located, similar to the art located outside the Police station in East Tampa (Figure 1).



Figure 1. Artwork by Charles E. Humes in East Tampa.

The above structure shows the cultural highlights of East Tampa and its residents. I plan to encourage development of a similar structure on a current brownfield site in East Tampa.

Case Studies

Below are a few examples of how other communities have turned brownfields into areas with public art as the centerpiece of a newly revitalized green space.

Seattle's Olympic Sculpture Park

In Seattle there was a brownfield that used to be an area where there were squat oil tanks. The area was located between downtown Seattle and Elliot Bay. This area did not only have health issues related to it, but it also had a potentially damaging effect on the local bay and marine life. By 1998, the land had been cleaned-up and revitalized by Union Oil of California. At the time Seattle's real estate market was booming and there were many potential buyers who wanted to buy the land, and some even had plans drawn. But, there was also a push for green space near downtown and the Seattle Art Museum was also looking for an outdoor area to display some of its art (*Attractions*, 2008).

The land was bought by the museum and other groups and was opened as a public park in 2007. It features walkways around the park, a glass and steel building, an open-air amphitheatre, and even a display that features all five of the Pacific-Northwest's environments (Figure 2) (*Attractions*, 2008).

“Five garden areas will reflect Pacific Northwest environments: valley (fir, cedar, ferns, and groundcovers); grove (aspen, flowering currant); meadow (grasses and wildflowers); and shore (low-lying pines, a pocket beach, and an underwater environment for fish)” (*Attractions*, 2008).



Figure 2. Seattle's Olympic Sculpture Park

Not a Cornfield

Los Angeles is the last place you'd expect to find a cornfield... at least today. The truth though is that Native Americans used this area for agriculture before Westerners settled there permanently. Lauren Bon, an artist, came up with an idea to turn this brownfield into an area with hopes to illustrate that art is much bigger than the artistic value that most people attach to it. She wanted to highlight the "power and function" of art by planting these crops in an area devoid of any agriculture whatsoever (Figure 3) (*Brownfields to Art Parks, 2006*).

The piece of land chosen by Bon was formerly used by the railroad, which discontinued use in 1989. Hydrocarbons and metals subsequently contaminated the land. The area was slated by local government to have warehouses developed on it, but Bon's group protested this and said that a park would be more appropriate. Once the land was acquired a large scale clean up of

5,000 tons of contaminated soil was in order, and shortly thereafter the corn seed was planted (*Brownfields to Art Parks, 2006*).



Figure 3. Lauren Bon's "Not a Cornfield" in Los Angeles

Pennsylvania's Crawford County Industrial Park

The first EPA Superfund site in the commonwealth of Pennsylvania was a former acetate fiber production facility. In 2001, Pennsylvania Governor Tom Ridge put revitalizing this area as one of his top priorities. The plan was to develop this area into a multi-use industrial park with the theme of sustainability. Nearby Allegheny College helped with the development plans by helping create "The Green Room," which is a break room located inside the industrial park for workers to use throughout their workday. The Green Room features art that promotes sustainability. During construction the project "evolved into an environmental education project, as well as a teaching resource for sustainability" (*Economic Progress Alliance, 2008*). Allegheny students and professors were praised for their community involvement. Donald Brown, Director of CEED said, "Colleges and universities must move from the teaching of environmental policy in the abstract to a more direct application of sustainability at the community level. The Green

Room represents exactly the kind of innovation and collaboration the Commonwealth of Pennsylvania would like to see occurring between its institutions of higher education and the private sector" (*Economic Progress Alliance, 2008*).

Inside the break room hangs a mural that the students at Allegheny also created. It is 33x17 feet in size and features the "industrial history and remediation of the site." The mural was created using recycled material from the clean up of the fiber factory, and is held up by wood that is certified as sustainable (*Economic Progress Alliance, 2008*). Figure 4 below shows the interior of The Dillon Center at the Crawford County Industrial Park.



Figure 4. Interior of one of the Dillon Center at the Crawford County Industrial Park.

The above examples illustrate how art can be a viable alternative to brownfield development when compared to a business or other economically sustainable structure. Although the above examples had strong financial backing and state officials were involved, I believe that a similar type of structure on a brownfield in East Tampa can provide similar results because the community is much smaller than those in the above examples. In smaller brownfield

revitalization projects state funding is not a necessity, and perhaps locals could donate their time and talents in the revitalization process, which would cut costs even further.

East Tampa

My argument for a public art structure in East Tampa stems from the same approach's success in other communities; however, all communities bring their own nuisances to the table in regards to the pros and cons associated with such a project. The community of East Tampa itself is a very culturally rich area, and it seems to be very communal. During our visit there I saw more than any other community I have been in locally an interaction between residents. Also, after speaking with Lorna it became clear that the residents of East Tampa utilize the newly renovated parks and green spaces. The interaction I saw and the use of public spaces leads me to believe that although a piece or series of public art exhibits may not bring money into the community of East Tampa, they will improve the quality of life of the residents by providing them another green space where a brownfield used to be.

I covered a few of the pros related to public art structures above, but in addition to those an argument could be made that this structure would bring positive publicity to the community of East Tampa, and the fact that they chose to put this type of structure on a brownfield instead of a business also suggests positive change in the community that outsiders may not recognize otherwise. For example, an art structure as opposed to a business or service (on a smaller brownfield) would reinforce the local community's dedication to the cultural history of the area, and grow a sense of pride in the talents of local artists, if local artists are chosen to create a piece of art for this project. These positive changes I believe would also help create a more culturally unique atmosphere in East Tampa, which could attract businesses and developers to purchase

larger brownfield sites in East Tampa. Lastly, this type of structure is much less costly than a permanent structure, and can be a good interim until the necessary funds are available for another structure to be built.

Some of the cons of a public art structure are mostly economic in nature. For one, a public art structure does not bring money into the community. An argument could be made that this type of structure may be even wasteful of a revitalized brownfield where a business could potentially be constructed that benefits both the community and brings outside money in. Along the same lines, the community of East Tampa is lacking certain necessary services, particularly in healthcare, and these brownfields provide opportunities for these services to be developed. Lastly, although the cost associated with a public art structure are much less than that of a permanent (building) structure, there is a cost associated with it, however little that is, and these funds could be used for a more beneficial service to be developed. However, if local artists would be willing to donate their services, these costs would be cut even further.

Possible Sites

I have outlined two sites below that I feel would be the most appropriate areas for a public art structure. I chose these sites for a variety of reasons. First, both these areas (site A and E) are the smallest brownfields in the packet that was given to us on the field trip. They both are less than a ½ of an acre in size. Second, these sites do not have any structures on them presently, making any clean-up minimal, and thus keeping costs down. Third, these sites are on intersections, which would enhance their visibility to motorists and others in the area.

Site A is located at 2932 N. 22nd Street. It is .11 acres in size and is free of any structures presently. One pro of this site is that it is near the police annex in East Tampa. Placing an art

structure here would go further to distinguish this area as a hub for activity and would encourage further development Below is an image (Figure 5) from Google Earth of Site A.

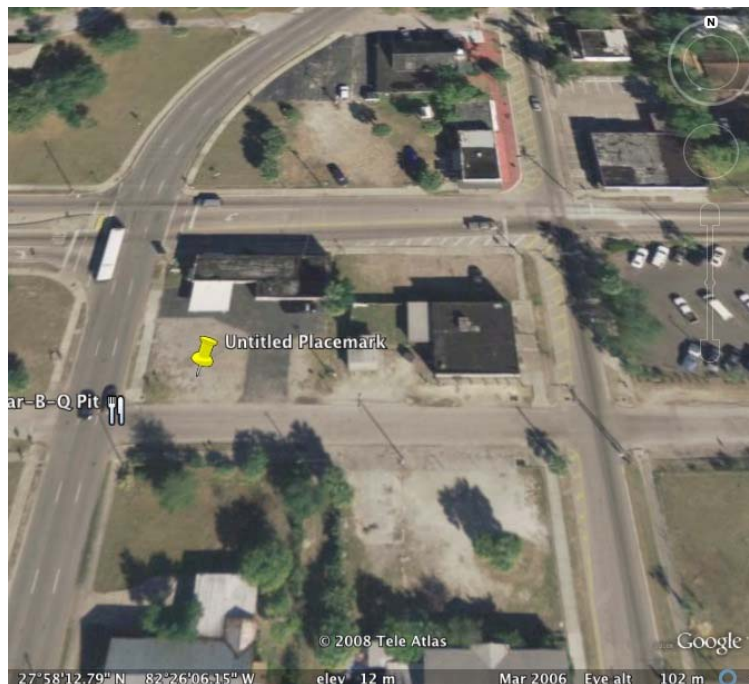


Figure 5. Site A (2932 N. 22nd Street, .11 acres)

Site E is located at 4612 N. 34th Street and shares many of the same attributes of site A, but is almost 3 times the size at .31 acres. Since this site is farther from the police annex art installation, it would provide local public art to a wider community. However because this site is larger than site A, it also provides the community with a larger green space when cleaned up. This site could very easily be made into a park with benches and seating areas, with the art structure included as a part of the park; it would not just be a space exclusively dedicated to this structure. Site E (Figure 6) is pictured below using Google Earth.

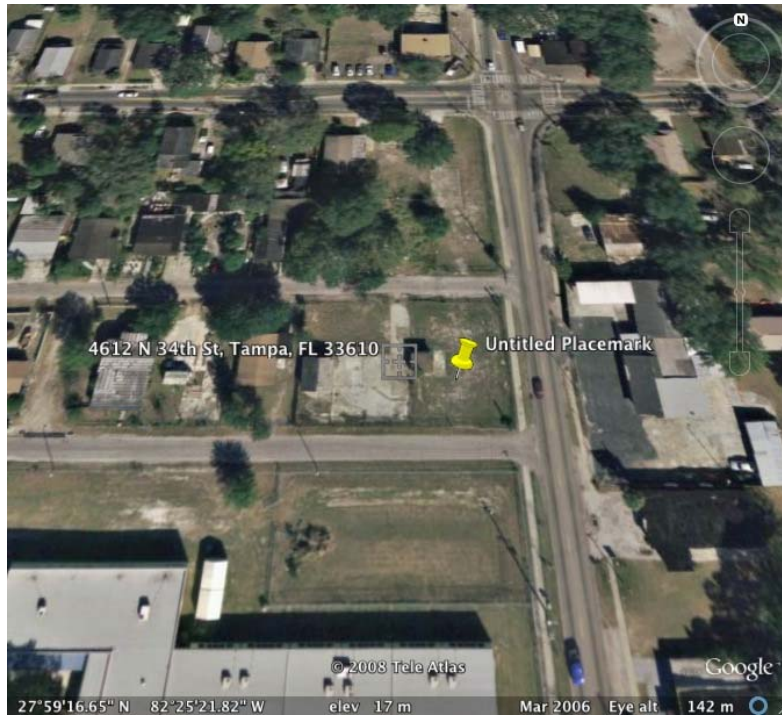


Figure 6. Site E (4612 N. 34th Street, .31 acres)

Proposal

This proposal requires the following steps:

1. Assess the current health risk associated with the soils in each site to see what type of clean-up would be involved. The more appropriate site (to be determined by East Tampa officials) can be remediated at a low cost (if necessary). If one site is contaminated more so than the other, this may help steer the decision on which site to use.
2. Clean up the current brownfield using sustainable practices.
3. Use a combination of surveys and interviews to determine the nature of the art display. I would suggest using open-ended interviews and focus groups or open forums in order to pull ideas from a larger pool of residents.

4. Hire a professional artist, or tap the local community for artists if possible.
5. Place the structure as the centerpiece of the revitalized land.
6. Place benches, tables, and a walking path in the area surrounding the art structure to compliment and highlight it.

The specific details about the structure should be determined by the local citizens. I do not want to suggest specific details about the structure as I feel it is more appropriate for the local residents to determine what they want in their community, but I do suggest that the structure be a reflection of the culture of the area, similar to the structure in the police annex. It is my hope that more small brownfields in this area will be converted into similar structures if business development is not feasible, or has stalled. I think a series of these types of “art parks” would greatly enhance the aesthetic value of the community of East Tampa and encourage outside visitors to travel to East Tampa.

Conclusion

A search for the definition of “community” returns a number of different ideas about what a community is. *Wikipedia* says that in human communities “intent, belief, resources, preferences, needs, risks, and a number of other conditions may be present and common, affecting the identity of the participants and their degree of cohesiveness.” In the research I have done I have come to understand that, like the definition above, a community is a cohesive unit, and this cohesion is a product of like experiences that members have faced. Culture seems to be the glue that makes up the interstitial space between the people that make up a community, and any opportunity to celebrate these experiences, culture or “glue” should be taken. I strongly feel

that a visible structure portraying the above (in the form of art) would be welcomed by the residents of East Tampa and be a permanent reminder of what makes their community unique... unlike any other in the world. I feel honored that we (outsiders) were given a voice in helping determine what will ultimately be an integrated part of the community of East Tampa. Whether it is a community center, grocery store, gym, or art park, these developments will bring positive sustainable change to this community and at the same time bring restoration to lands that are in need of revitalization.

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