Practice Guide #36

Summer 2015

Implementing Environmental Psychology Principles to Improve Community Design

by

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Introduction to Environmental Psychology

Environmental psychology is the study of how humans interact with their natural and built environments (Bonnes and Secchiaroli, 1995; Holahan, 1986; Kopek, 2014). At its heart are evaluations of how the physical elements of the space (e.g., temperature, humidity), as well as individual social factors (e.g., upbringing, socialization) and biological responses (e.g., shivering in respond to cold temperatures, wheezing in response to allergens) influence the end-user. These processes are driven by both perception and response.

Even though it is, as a discipline, user-friendly with applications to all levels of project design and reevaluation, little has been done to ensure that the knowledge of the discipline is made accessible to community members who could best implement it in their community improvement efforts (McKenzie-Mohr, 2000). This practice guide attempts to address this oversight through an explanation of the specialty, case studies that illustrate the application of core principles in the field to overcome existing challenges, and suggestions for funding sources to put ideas into action.

Brief History

Environmental psychology developed in the late 1960s as a discipline known for responding to practical, real-world situations encountered in the field by architects and planners (Holahan, 1986). Its genesis as a topical area within the behavioral sciences can be traced to the late 1950s when the Proshansky Group, social psychologists working at City University of New York, began to apply their scientific knowledge of person-place interactions to the planning of health care settings (Proshansky, et al., 1970; Spencer and Gee, 2009).

An important consideration for this guide is that the principles of the discipline can be applied, with positive results, to community space planning and design. For example, the addition of a beautified green space with a few benches to an underprivileged neighborhood can improve the quality of community life. The Hawthorne Studies suggest that any physical change in the environment would be viewed as an improvement (Roethlisberger and Dickson, 1939). Neighbors would consider the improvements a privilege and feel special as a result, and adding a meeting place has just increased the potential for social contact. Secondary outcomes could include increased neighborhood pride and engagement related to the increased positive feelings and potential group efforts that may have arisen as a result of social interaction that would not have otherwise taken place.

Fundamentals of Environmental Psychology

This segment covers some of the basics of environmental psychology such as crowding and density, territoriality, privacy, meanings of place, environmental risks, and gentrification.

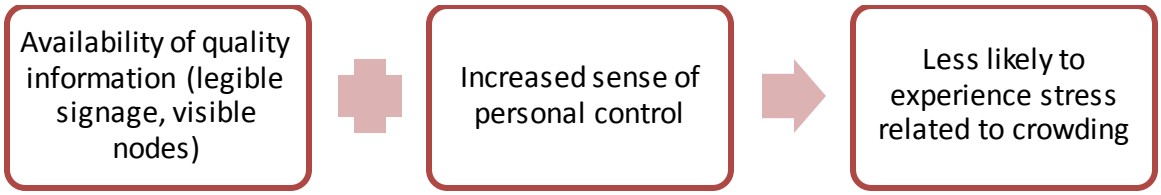
Crowding and Density

Density is the ratio of individuals to an area. Crowding, on the other hand, is an individual's psychological reaction to density that produces emotional and behavioral responses. This may result from too little space, too many people, or a combination of the two. Crowding has three components: behavior, emotion, and situation. As crowding levels increase, negative behavioral changes (e.g., aggression, lower task performance, withdrawal) may be exhibited. It is not uncommon for those who experience crowding to feel anxious. The situation and its relationship to the perception of crowding is multi-faceted.

Atmospherics are environmental cues that help to create the overall mood of the setting; they are situation-specific. Examples include scents, lighting levels and glare, intentional and unintentional sound, and climate. Density-Intensity Theory states that high density itself is not necessarily problematic, but when paired with heat or unpleasant odors, it is more likely produce feelings of crowding. For example, a high density space that has proper lighting, climate control, and noise reduction is less likely to induce the reaction of crowding, whereas an environment with the same density but exceeds the threshold for those atmospherics (i.e., is hot, loud, and very bright) will be more likely to result in feeling crowded.

Proxemics, or interpersonal distance, is involved in crowding as well. Individuals have a portable, flexible, and variable territory, often called the "body bubble," that they require in order to feel comfortable in their interactions with others (Hall, 1966). People have spatial needs both horizontally and vertically. This phenomenon does not exist without human interaction. Interpersonal distance preferences vary according to age and development, experience, environmental setting (physical space and purpose), and nature of the relationship between individuals. Cultural norms and socialization are important as well. Individuals from high-density areas, such as New York City, are likely to have become accustomed to its spatial availability or lack thereof, and better tolerate physical interactions with much less personal space. On the other hand, individuals from a lower-density rural area may be more likely to have a need for a larger body bubble. Hall's research resulted in the categorization of four interpersonal distance zones: intimate, personal, social, and public. In general, the more personal one's relationship is to another, the more tolerance there is for physical closeness.

Experience of crowding additionally depends on a person's perceived level of control, purpose for being in the space, expectation of the space, other people with whom the space is shared, and available information about the situation. For example, a person who chooses to shop retail on the busiest day of the year but does so with friends, a plan, and an understanding that there will be crowds, may be able to tolerate the higher-density conditions without experiencing intolerable feelings of crowding.



Territoriality

Territoriality refers to the ownership, exclusive use, and defense of a personal space. In many ways, these things are experienced physically, but there may be a sense of psychological ownership as well. Territoriality serves as a means of organizing behavior in order to decrease violence and domination. Many occupants mark territory or establish ownership over a space by using objects to indicate boundaries. Personalization is a frequent means by which humans mark their territories by using aspects of their personal identities (e.g., photographs, knick-knacks, awards, certificates). Some territorial markers are clearer than others, but the goal is always to avoid invasion, violation, and contamination of one's space.

Meanings of Place

Place identity, sense of place, and place attachment are important components studied by environmental psychologists because humans' feelings of belongingness and bonding with the physical environment are crucial to community development. Research has shown occupants of neighborhoods that are declining or devastated still endorse feelings of attachment for the areas based on family, community, and shared experiences (Mah, 2009). The particular branch of psychology determines the approach taken to the study of meanings of place. Environmental psychologists tend to emphasize individual experience, while community psychologists focus on social aspects of attachment (Manzo & Perkins, 2006). Planners may combine the two perspectives in the best interest of fostering community spirit. Goals of design (and redesign) should include end-user satisfaction with the setting and support of hierarchical needs such as safety.

Environmental Risks

Another key area of study by environmental psychology is environmental risk. The evaluation of potential dangers of inhabited spaces is a critical component of the field, the goal of which is to minimize risk and maximize the physical and psychological health of the end-users. Factors such as pollution (air, odor, noise), overpopulation (crowding, crime), diseases (congenital, acquired), and technological hazards are explored (Kopek, 2014).

Gentrification

Gentrification is defined as the renewal and rebuilding of deteriorating areas. Three focal areas of gentrification are public, private, and community. Public gentrification is a consequence of government seizure and development of an area, usually one in a significant state of decline. When one or more individuals work to redevelop an area through private funding, it is considered a private gentrification effort. Finally,

community gentrification entails community and neighborhood members supporting of their local area businesses through retail activity and investment.

Case Studies

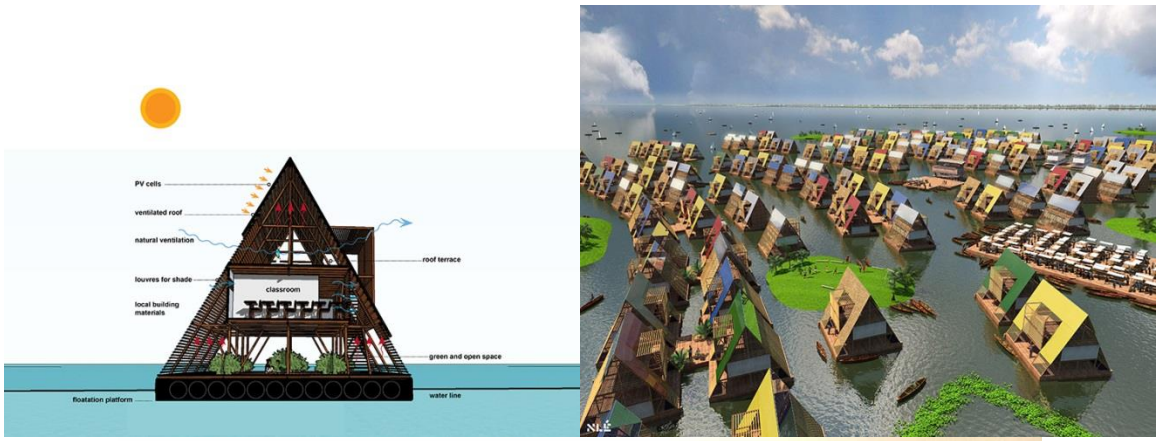
The following projects demonstrate the successful utilization of environmental psychology in community design. Each illustrates a different challenge commonly tackled by designers through the application of environmental psychology theories and principles.

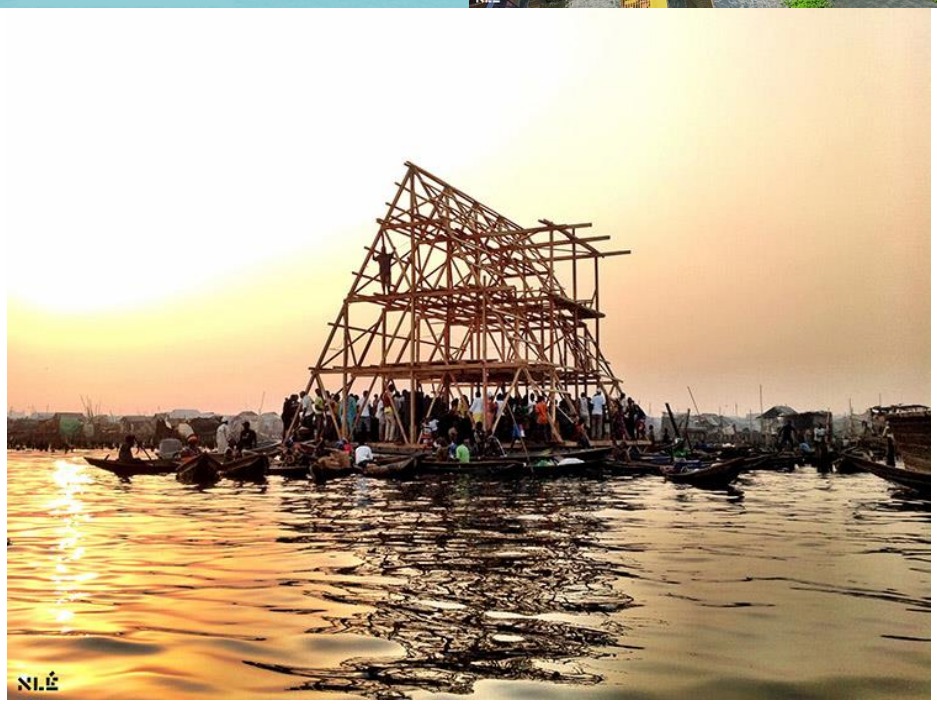
Extreme and Unusual Environments (EUE)

EUEs are spaces in which community success and human survival are extremely challenging (Suedfeld, 1987). Without advances in modern technology, humans would not have been able to thrive in them. Sometimes these areas are sought out by individuals or communities, other times they are the result of a natural disaster or simply a product of the existing geographic elements.

Makoko Floating School (Lagos, Nigeria)

Makoko is a coastal slum neighborhood in Lagos, Nigeria. Its erratic climate makes it vulnerable to flooding, and it has no roads or infrastructure to sustain its existence. Suedefel (1987) would classify the area as an EUE. In Lagos, primarily a self-sustaining fishing community, homes are often built on stilts in the waters of the lagoon. About 100,000 Makoko residents live in such structures. NLÉ Architects (2014) proposed and implemented a groundbreaking solution to counter the environment's inherent weaknesses: a floating structure that adjusts to tidal and water level changes in order to resist flooding and storms (Dougherty, 2014). Not only does it accomplish that goal, but it also uses renewable energy, recycles organic waste, and harvests rainwater. The long-term plan is to create an interlocking, floating community (see rendering below) that includes not only the school but also residences. For now, the goal is to address the physical and cultural needs of the community in an innovative way. The school will not only serve as a place to educate their children but can also function as a community market or clinic. Project construction began in 2012 and incorporated local materials, such as ecofriendly bamboo. This case study illustrates creativity, ingenuity, and how a self-funded project can grow into a community-changing venture. While it is not directly applicable to regional issues, one might imagine applying environmental psychology principles to reclamation efforts of mountaintop removal sites.





Images used with permission from NLÉ

Wayfinding

Lynch (1960) referred to how individuals find their way in the physical world as wayfinding. It is made easier through mechanisms such as visual access (i.e., unobstructed lines of sight), spatial organization (i.e., logical progression of circulation space into manageable sections), architectural delineation (i.e., using physical elements such as thresholds, walls, columns, etc. to fully or partially separate areas), strategic placement of noise-producing zones, and environmental communication (e.g., signage). Signage may include words, pictographs (e.g., symbols, logos, and images), directional arrows, and numbering systems. Ideally, signage will make a space more understandable by identifying locations, objects, and acceptable human activities.

Calgary City Centre (Alberta, Canada)

The innovative wayfinding design for the City Centre in Calgary breathed new life into the area (Gerylo and VanderKlipp, 2013). An interdisciplinary group of stakeholders including city planners and designers, sign makers, representatives from the municipal government's communication department, tourism industry agents, business revitalization zone representatives, and administrative teams for the disabled worked to establish a cohesive model that kept the end-user as its focus. Choices regarding placement and scale were made based on pedestrian views. Locally recognized terms (i.e., "speaking Calgarian") were incorporated into the verbiage (CorbinDesign, 2014). The previous wayfinding design did not utilize a consistent theme. Designers for the new model chose to make this an effort that would unite the districts, helping to connect the people to happenings and places. Their goals were to encourage residents to walk more and discover their city, advertise points of interest in the downtown area, enhance visitors' understanding of the Centre's layout in order to navigate through the space more easily, and generally improve visitors' experience. The new model was introduced to the community through the press and celebratory events in an effort to familiarize the public with the program.

Photo used with permission from Corbin Design Inc.

Metropolitan Transportation Authority (Long Island, NY)

Advancements in technology are allowing designers to diversify the implementation of wayfinding (Saunders, 2013). Environmental graphic designers can assess whether digital or static signage is most appropriate for its intended area depending upon purpose of space and end-user needs (Porco, 2013). Digital and audio signage can provide updates regarding alternate emergency routes, serve the needs of the visually impaired, or improve environmental legibility through interactivity (e.g., touch screens). In 2008, the Metropolitan Transportation Authority (MTA) and MTA Long Island Rail Road introduced a "talking kiosk" featuring a touch-activated, tactile station map, vibrant visual displays, and a voice guide (Metropolitan Transportation Authority Press Releases, 2008). The project's goal was to enhance the legibility, accessibility, and comfort of the facilities. More recently, the MTA and NYC Transit have plans for solar-powered kiosks

that are able to operate on a small amount of sunlight for up to 10 days, thus incorporating sustainability into their design scheme (Lee, 2014).

Crime Prevention through Environmental Design (CPTED)

Crime prevention through environmental design (CPTED), introduced in 1961, is based on the idea that community design and planning impacts crime occurrence and fear of crime (Jacobs, 1961; Jeffery, 1971; Newman, 1972). The importance of green spaces is emphasized because they are virtual indicators of neighborhood and community involvement. They have the potential to increase social interaction and decrease territorial infringement. In addition to neighborhood communities, environmental settings such as service-scapes, banks, and gas stations can be crime generators; they are accessible, public territories with money and goods on site. CPTED offers a variety of design recommendations (Kopek, 2014):

- Surveillance cameras
- Limit amount of cash on site and post the limit
- Position furnishings and fences in ways that decrease the ease of escape
- Door detectors
- Height markers on exit doors
- Natural surveillance points with unobstructed views
- Physical and visual connections among spaces
- Physical and symbolic barriers that define boundaries and mark territories
- High intensity street lighting and motion-sensor lighting systems

Good Hope Neighborhood Recreation Center (Silver Spring, MD)

The existing neighborhood center in Silver Spring, MD, a suburban city north of Washington D.C., is in need of an overhaul. The structure was old, too small for its current membership, non-compliant with Americans with Disabilities Act (ADA) requirements, and had poor natural surveillance points (Cooper, 2014; Montgomery County Maryland Division of Building Design and Construction Services, 2014). The new building, planned to be more than twice the size of its predecessor, incorporates improved amenities and complies with Leadership in Energy and Environmental Design (LEED) guidelines.

Additionally, the new structure addresses community concerns about crime, which was among their chief complaints in spite of comparatively low instances of reported criminal activity. Gambling, drugs, and alcohol are the most commonly cited legal problems. Additional neighborhood concerns included fighting and graffiti. Two community design charrettes have been conducted and regular public meetings continue to be held. Planners are taking the community perception of crime and safety very seriously, and with input from the neighborhood action committee, designers, and police, have integrated CPTED recommendations into the schematics. In order to allow for unobstructed lines of sight and natural surveillance points the location of the building will be moved. Exterior lighting and parking lot design should help to deter traffic problems as well as criminal activity at night. Open communication between neighbors, police, administration, and designers are creating the opportunity for a successful project.

Traffic Calming

Traffic calming was developed in Europe as a means of balancing traffic on streets with other uses; vehicles should share the streets with pedestrians (Project for Public Spaces, n/d). Streets can be a component of a neighborhood that contributes to residents' community spirit and place attachment as children play; families take walks, people shop, etc. Traffic calming intends to treat streets as places where vehicles and humans co-exist. Strategies are intended to decrease the speed of motor vehicle traffic, lower crime (in part by improving neighborhood surveillance), and diminish traffic flow, all of which should increase the safety of children, pedestrians, and cyclists. Traditional strategies include speed humps and tables, traffic circles, road narrowing or choking, diagonal diverter, full street closures, entry treatments, median barriers, and raised crosswalks (The District of Columbia, n/d).

Fifth Street Pedestrian Enhancement and Traffic Calming Project (Tempe, AZ)

Fifth Street in the Riverside and Sunset neighborhoods of Tempe, AZ is an arterial neighborhood road in a 1.5 square mile area with approximately 5,500 residents (Institute of Transportation Engineers, n/d). In the mid-1990s community concerns regarding traffic volume and speed led to a citywide effort to address the problem at hand. Neighbors wanted to increase pedestrian and cyclist safety, decrease air pollution, and preserve the community atmosphere. The city responded by applying for and obtaining of total of $3,000,000 from the Pedestrian Improvements Funding and the U.S. Department of Transportation Intermodal Surface Transportation Efficiency Act Enhancements Funding Budget in order to implement traffic calming strategies on Fifth Street. The project was a collaborative effort in which city officials solicited input from neighbors, property owners, local businesses, and school officials. The initial effort was a trial run to test effectiveness and neighborhood reaction. Pedestrian improvements included adding widened sidewalks, landscaping such as shade trees, and pedestrian-level street lighting. Five-foot bicycle lanes were added for cyclists. Among the traffic calming applications instituted were traffic chokers, bulb-outs, chicanes, speed tables, and on-street parking (City of Tempe, n/d).

The Fifth Street project was completed in 2001 with positive results. Vehicular traffic was reduced by 6,000 vehicles per day in some areas. There was an overall reduction in

traffic counts in average daily traffic. Cut-through traffic volumes and speeds have decreased and bus service has increased. Also, thanks to the incorporation of rustic artistic design features, the neighborhood character has endured. The true testament to its success is that the project has been used as a model by several cities in the U.S.

Photos used with permission from the City of Tempe

Funding Mechanisms

Ultimately, this guide aspires to provide stakeholders with useful information that inspires them to initiate community improvements. These projects, however, cannot be initiated without funding. Sometimes projects originate from a stakeholder who is able to fund the efforts privately, which is the way the Makoko project began. Collaborating with stakeholders (e.g., city government, designers, and developers) may provide other avenues for funding.

Many cities and states have discretionary funds set aside that can be accessed for projects such as the ones described in this guide. For instance, Vancouver, Washington is allocating $170,000 for Neighborhood Traffic Calming projects in 2015 (City of Vancouver Washington, 2015). Proactive citizens, city officials, and planning project managers must be diligent and creative in seeking grant funding or other resources that will comprise or supplement their design budget.

Several options were illustrated by the case studies included in this guide. Municipalities and local stakeholders interested in pursuing innovative local development can derive funding in whole or part from all levels of government, private sector and foundations, often in combination. Federal support also exists that may enable local agencies to leverage a variety of funding sources, reduce principal and interest costs on projects, and minimize risk to private investors. General resources for finding funding related to the kinds of projects discussed in this practice guide are provided below.

State-level Government Resources

State Economic Development Agencies – http://www.sba.gov/content/economic-development-agencies

Every state and many local governments have economic development agencies dedicated to assisting new and established businesses start, grow and succeed. Services provided by these agencies typically include start up advice, training and resources; financial assistance with loans, grants and tax-exempt bonds; business location and site selection assistance; employee recruitment and training assistance.

Federal Resources

Bicycle and Pedestrian Program, U.S. Federal Highway Administration – http://www.fhwa.dot.gov/environment/bikeped/index.htm

Resources may be found here on available funding sources for pedestrian and bicycle projects and guidance about accessible design.

Building Blocks for Sustainable Communities, U.S. Environmental Protection Agency (EPA) – http://www.epa.gov/smartgrowth/buildingblocks.htm

Provides quick, targeted technical assistance to communities to achieve development goals, improve quality of life, and increase economic and environmental sustainability.

Grants.gov – http://www.grants.gov/

Under the President's Management Agenda, the office was chartered to deliver a system that provides a centralized location for grant seekers to find and apply for federal funding opportunities. Today, the Grants.gov system houses information on over 1,000 grant programs and vets grant applications for 26 federal grant-making agencies.

Partnership for Sustainable Communities – http://www.sustainablecommunities.gov/index.html

This interagency partnership of three federal agencies (U.S. Housing and Urban Development (HUD), U.S. Department of Transportation, and the U.S. Environmental Protection Agency (EPA)) works to coordinate federal housing, transportation, water, and other infrastructure investments in communities.

U.S. Department of Energy's Energy Efficiency and Renewable Energy Program on Solid-State Lighting (SSL) – http://www1.eere.energy.gov/buildings/ssl/sslbasics_whyssl.html

This agency offers a variety of outdoor lighting resources to guide municipalities and utilities in their evaluation of LED street lighting projects.

U.S. Department of Energy's Municipal Solid-State Street Lighting Consortium – http://www1.eere.energy.gov/buildings/ssl/consortium.html

This organization offers a variety of outdoor lighting resources to guide municipalities and utilities in their evaluation of LED street lighting projects.

U.S. Department of Housing and Urban Development Homeless Assistance – http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/homeless

HUD provides funding and networking resources for homelessness assistance.

Wayfinding Sign Maintenance Federal Grant – http://www.federalgrants.com/Wayfinding-Sign-Maintenance-37827.html

If wayfinding improvements are the goal, a variety of funding opportunities can be found here including information specific to cities, business start-ups, women, and minorities.

Environmental Psychology/Design Resources

Environmental Design Research Association (EDRA) – http://www.edra.org/

EDRA hosts a wealth of searchable resources including conference proceedings; citation indices; several journals, as well as coverage of industry news and developments.

International Association People-Environment Studies – http://www.iaps-association.org/

This is an international consortium for researchers and practitioners interested in how people interact with their environment which provides a digital library as well as opportunities for networking.

Project for Public Spaces – http://www.pps.org/

Originally created out of urban sociologist William Whyte's Social Life of Urban Spaces, Project for Public Spaces (PPS) is a nonprofit planning, design and educational organization which provides resources, training, and support for place-making.

Private Sector Resources

Habitat for Humanity – http://www.habitat.org/

Habitat for Humanity is a nonprofit, ecumenical Christian ministry founded on the conviction that every man, woman and child should have a decent, safe and affordable place to live. They build with people in need regardless of race or religion and welcome volunteers and supporters from all backgrounds.

Lowe's Charitable and Educational Foundation Grants – http://www.lowes.com/cd_Charitable+and+Educational+Foundation_936258779_

Educational Foundation funds nonprofit organizations and public agencies that support our charitable goals. The foundation's primary philanthropic focus centers on K–12 public education and community improvement. Within these areas, Lowe's Foundation is committed to supporting projects that have the greatest impact on communities and align with their core business – home improvement.

National Complete Streets Coalition – http://www.completestreets.org/

> Provides information to assist citizens/communities develop a complete streets policy to advocate for safer streets by building sidewalks, crosswalks, bike lanes, etc. The Coalition also offers interactive full-day workshops led by national experts to help communities with this process.

National Sheriffs' Association Neighborhood Watch Program – http://www.usaonwatch.org/

> This program offers information on starting and registering Neighborhood Watch programs.

Neighborhood Watch Manual – http://www.usaonwatch.org/assets/publications/0_NW_Manual_1210.pdf

> This manual is available as a download for citizens and law enforcement officers to use to help establish watch programs.

Tree City USA, National Arbor Day Foundation – www.arborday.org

> Provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs.

SafeRoutes – http://maps.saferoutesinfo.org/

> An excellent resource for local, private and federal funding that assists the user in identifying funding sources based on location.

YouthBuild USA – https://youthbuild.org/

> YouthBuild aids unemployed and undereducated young people, age 16 to 24, to build affordable housing for homeless and low-income families in their own communities. Participants split their time between the construction site and the classroom, where they earn their GED or high school diploma, learn to be community leaders, and prepare for jobs or college. Presently, there are 273 YouthBuild programs in 46 states, Washington, D.C., and the Virgin Islands engaging approximately 10,000 young adults per year (YouthBuild, 2014).

Conclusion

It is essential that designers, developers, and community members, who bear responsibility for the integrity of our built environment, understand the enduring impact of design that utilizes the principles of environmental psychology. The construction industry must address the emotional and behavioral needs of the end-users.

Environmental psychology, as a discipline, is intended to solve the kinds of problems with which communities are faced on a daily basis. Incorporating its theories of perception, environmental experience, and community with the greater-good concern of sustainability is a critical point for successful completion of design endeavors (Gifford, 2007). As evidenced by the case studies, successful projects are the result of the awareness of environmental psychology, collaborative and interdisciplinary approaches that value the input of neighbors, and financial support. When stakeholders understand the basic principles of environmental psychology, then they can begin to identify local areas of need and recognize opportunities to implement those ideas in projects in their own communities.

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