

Title of Thesis: COMMUNITY BASED APPROACHES TO STORMWATER
DESIGN IN A BALTIMORE NEIGHBORHOOD

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This interdisciplinary research-design thesis explores the role of resident engagement in developing a design criteria for urban stormwater runoff design solutions, urban greening, and activating public spaces in the urbanized McElderry Park neighborhood of Baltimore. Drawing upon stakeholder and resident interviews, community workshops, resident working groups, and site observations and analysis the designer developed design criteria for site interventions as well as neighborhood-wide programming elements.

Residents identify jobs, safety and health as primary concerns. Beyond harvesting stormwater, site interventions must provide safety, education, entrepreneurial opportunities, exercise, etc. Building on community input, the design interventions proposed by the designer are site specific, but the intervention types are readily adaptable. The overall design process and programming strategies apply to a variety of urban sites. Given the amount of stormwater managed by the interventions, the potential jobs created by the interventions, and other benefits provided to residents, the model merits field testing at the neighborhood scale.

COMMUNITY BASED APPROACHES TO
STORMWATER DESIGN
IN A BALTIMORE NEIGHBORHOOD

by

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Table of Contents

| | |
|---|-----|
| Figures | iv |
| Introduction | 1 |
| 1. The Role of Ecological Urbanism and Community Engagement in Design Approaches | 3 |
| 2. Research and Design Process | 11 |
| 3. Precedents | 14 |
| 4. Site Selection and Context | 25 |
| 5. Neighborhood Stormwater | 32 |
| 6. Existing Morphology | 49 |
| 7. Community Engagement Process | 63 |
| 8. Community Engagement Outcomes | 74 |
| 9. Engagement Outcomes and Site Analysis | 87 |
| 10. Site Interventions and Neighborhood Programming | 96 |
| 11. Design Response: Illustrative Stormwater Plan and Focus Areas | 105 |
| Conclusion | 131 |
| Appendix A | 133 |
| Appendix B | 139 |
| Appendix C | 146 |
| Works Cited | 147 |

Figures

| | |
|--|----|
| Figure 1: Conceptualizing influences on design | 6 |
| Figure 2: Research design process | 12 |
| Figure 3: Arkadien Asperg Master Plan | 15 |
| Figure 4: Waterway and Path | 15 |
| Figure 5: Tanner Springs Park | 16 |
| Figure 6: Detain from proposal for Gowanus Sponge Park | 18 |
| Figure 7: EcoBox in action | 19 |
| Figure 8: EcoBox plan | 20 |
| Figure 9: Bankside Forest conceptualizing relationships | 21 |
| Figure 10: Streets, Streams and Open Spaces | 22 |
| Figure 11: Real Food Farm facts | 23 |
| Figure 12: Baltimore City and McElderry Park Neighborhood | 26 |
| Figure 13: Baltimore and McElderry Park Watershed Context | 27 |
| Figure 14: Stormwater Path: McElderry Park to Inner Harbor | 29 |
| Figure 15: Historical Harris Creek River | 30 |
| Figure 16: Historical Path of Harris Creek River | 31 |
| Figure 17: Demographics | 33 |
| Figure 18: EcoCheck's Bay Report Card | 34 |
| Figure 19: McElderry Park's topography | 39 |
| Figure 20: Existing surface water flow | 40 |
| Figure 21: McElderry Park Basic Stormwater Statistics | 41 |
| Figure 22-23: Alleys and water flow | 43 |
| Figure 24: Trash and water flow | 43 |
| Figure 25: Storm drains and waterflow | 44 |
| Figure 26: Garbage in storm drain | 46 |
| Figure 27: Map of McElderry Park's UTC | 47 |
| Figure 28: McElderry Park aerial and traffic | 49 |
| Figure 29: Land Use | 51 |
| Figure 30: Figure Ground | 52 |
| Figure 31: Row Home Elevation | 54 |
| Figure 32: Row Home Materials | 54 |
| Figure 33: Street Section Profiles | 55 |
| Figure: 34: Figure Ground Inverse | 56 |
| Figure 35: Views shaped by topography | 57 |
| Figure 36: Paved alleys | 58 |
| Figure 37: Fencing in alleys | 59 |
| Figure 38: Rear yards and alleys | 59 |
| Figure 39: Alleys collect garbage | 60 |
| Figure 40: Utilities and alleys | 61 |
| Figure 41: Timeline of Community Engagement and Design Process | 64 |
| Figure 42: Stakeholder organizations | 66 |
| Figure 43: Resident interviews | 67 |

| | |
|---|-----|
| Figure 44: Community leader meetings | 68 |
| Figure 45: Neighborhood working groups | 69 |
| Figure 46: Large community workshops | 70 |
| Figure 47: Primary and secondary concerns | 75 |
| Figure 48: Word Map of Community of Desires | 77 |
| Figure 49: Community Mapping: Issues of Concern | 79 |
| Figure 50: Community Mapping: Important Locations | 80 |
| Figure 51: Community Mapping: What the Neighborhood Needs | 81 |
| Figure 52: Community Mapping: Finding Space for Green Space | 82 |
| Figure 53: Community Mapping: Amenities | 84 |
| Figure 54: Conceptual design sketches | 85 |
| Figure 55: Street of row homes | 88 |
| Figure 56: Row home block resident's wish to emulate | 89 |
| Figure 57: Row home block resident's consider problematic | 89 |
| Figure 58: Walking distances to services | 90 |
| Figure 59: Human traces | 93 |
| Figure 60: Human use: economic enterprise | 94 |
| Figure 61: Community Design Opportunities Matrix | 95 |
| Figure 62: Site intervention locations and programming | 96 |
| Figure 63: Locations for design interventions | 100 |
| Figure 64: Impervious playground surfaces | 101 |
| Figure 65: One-third of area is parking | 101 |
| Figure 66: West side of Port Street | 101 |
| Figure 67: East side of Port Street | 101 |
| Figure 68: Lakeside Avenue row homes | 102 |
| Figure 69: Lakeside Avenue street profile | 102 |
| Figure 70: View West toward Spanish War Memorial | 103 |
| Figure 71: Harvesting Alleys and Courtyard Alleys | 106 |
| Figure 72: Water flow and bio-retention | 107 |
| Figure 73: Proposed parking and traffic flow | 108 |
| Figure 74: Existing parking and traffic flow | 109 |
| Figure 75: Water Collective sites | 110 |
| Figure 76: Economic Opportunities | 111 |
| Figure 77: Links beyond neighborhood and Quadrants | 112 |
| Figure 78: Water Collective Resources and Services | 114 |
| Figure 79: McElderry Park Stormwater Master Plan | 115 |
| Figure 80: Proposed location for the Water Location | 116 |
| Figure 81: Parking Lot Diagram | 121 |
| Figure 82: Rain Watch Park Plan | 123 |
| Figure 83: Rain Watch Park Perspective | 124 |
| Figure 84: Port Plaza Plan | 125 |
| Figure 85: Port Plaza Land Use and Activity | 126 |
| Figure 86: Port Plaza Section | 126 |
| Figure 87: Harris Creek Walking Park Plan | 127 |
| Figure 88: Library Square Plan | 128 |
| Figure 89: Library Square Section | 129 |



Introduction

What is the role of community engagement in stormwater management? What can an urban neighborhood do with its asphalt, concrete, roofs and other impervious surfaces? And how can a community address the issue of high impervious cover through design within the constraints of a strong urban morphology? These are questions facing many urban neighborhoods and one that this design research thesis explores in relation to one neighborhood in Baltimore, MD.

Impervious Cover (IC) has become an increasingly important and better understood factor in the quality of a watershed's run-off.(Schueler, Fraley-McNeal, & Cappiella, 2009). As IC increases water quality declines. All contributors to poor water quality, including agricultural and industrial point and non-point polluters, must make improvements in land management. However, as most design interventions available to infiltrate and bio-remediate stormwater require pervious land, urban areas can be at a disadvantage. The simple idea of pulling up the pavement and letting the ground below soak up storm water is attractive, but those paved areas serve a variety of functions (roles) in urban neighborhoods. Those functions could be easily lost in the fervor to clean up the stormwater (Kwinter, 2010).

Community engagement can steer the site analysis and design development process to ensure that vital urban functions are maintained. Condon (2008) sets forth a charrette process which seeks to elicit wide ranging input from residents and stakeholders. The designer combines a revised version of these community engagement techniques with an ecological urbanism framework to assure that the community's needs and values are given first consideration while addressing stormwater concerns. The end result is a stormwater management master plan for the McElderry Park neighborhood of Baltimore City.

1

The Role of Ecological Urbanism and Community Participation in Design Approaches

Ecological Urbanism

This research design thesis uses as its primary theoretical lens the field of ecological urbanism. Forman defines urban ecology as “the study of the interactions of organisms, built structures, and the natural environment, where people are aggregated around a city or a town” (2010, p. 312). Urban ecology examines and seeks to understand complexities of interactions, relationships and processes in the urban environment. While the scientific ramifications are important when considering stormwater design interventions, Sanford Kwinter’s caution in “Notes on the Third Ecology” equally applies. Kwinter warns that it is an “unexamined and possibly dangerous supposition” that the solution to urban problems is always the most modern and rational. (Kwinter, 2010, p. 99) He points to the relationships between humans and a variety of systems in urban areas, for example those in Mumbai who rely on recycling for their livelihood. Kwinter’s point is: a proposed urban design that disrupted this system would harm the well-being of these people.(Kwinter, 2010) equally applies. Any change in the urban ecology as it exists must take into account more than the proposed physical structures, the hoped for economic returns, and the perceived public good.

Moshen Mostafavi in his article, “Why ecological urbanism? Why Now?” moves beyond the study of the urban ecology and examines the characteristics of ecological urbanism “as a means of providing a set of sensibilities and practices that can help enhance our approaches to urban development,” (Mostafavi, 2010, p. 26). He clarifies that ecological urbanism is not a “totally new and singular mode of design practice. Rather, it utilizes a multiplicity of old and new methods, tools and techniques in a cross disciplinary and collaborative approach toward urbanism developed through the lens of ecology” (Mostafavi, 2010, p. 26) Mostafavi agrees with Kwinter that ecological urbanism has no place for old the old binary nature/human manner of thinking. Instead, ecological urbanism explores notions of adaptability, flexibility, density, informality, and conflict that are a necessary “to engender greater opportunities for social and spatial democracy,” (Mostafavi, 2010). The designer finds this frame particularly suitable to site analysis and keeps the designer from imposing pre-conceived ideas on the site.

Even so, an important aspect of ecological urbanism is that it is not value free. It chooses pluralism over hegemony; conflict over homogeneity; change over stasis. And ecological urbanism accounts for the human: Social well-being must be at the “heart of our posture toward our environmental context,” (Kwinter, 2010, p. 103). Ulrich Beck illustrates how ecological urbanism understands the relationship between climate change induced catastrophes in one country and the extravagant use of fossil fuels in another. The “costs” of such resource use are not latent, but paid on the heads of the less privileged, (Beck, 2010). An ecological urbanism

approach, even at a global scale, seeks sustainability, longevity—but not at the expense of any one thread in the fabric. This is not the equivalent of stasis; rather change becomes the norm as one thread is pulled, loosened or tightened, the warp of the fabric shifts, the pattern changes, an unseen thread appears and so forth.

This has particular relevance for urban neighborhoods where different forms of inequality are often at play and designers confront social justice issues. Designers must ask the questions regarding who benefits from any given intervention. And designers must be honest—sometimes it is not the intended party. Ecological urbanism may succeed where other approaches have failed in helping designers to consider, if still not immediately understand, the ramifications of any given intervention (Robbins, 2010).

But what design strategies does ecological urbanism offer? While some of the scholars in this new field may be addressing normative issues, they are not particularly prescriptive when discussing the design strategies that ecological urbanism offers. At the Ecological Urbanism Conference that took place at Harvard, April 3-5, 2009, Andrea Branzi offered what he referred to as “suggestions.” He says that “city has always to be reformed, reshaped and replanned, in search of temporary balances that need an ongoing setting...that everyday has to produce new laws and rules to manage its permanent crisis in a positive way” (Branzi, 2010).

Several of Branzi’s (2010) suggestions informed this design research thesis, specifically: 1) Urban refunctionalization; 2) Great transformation through

microstructures; 3) The city as a personal computer every 20 square meters; and 4) Cosmic hospitality (Branzi, 2010). The designer adapts these particular strategies along with one from James Corner's discussion of landscape urbanism in "Terra Fluxus," that applies to ecological urbanism as well: "design relationships between dynamic environmental processes and urban form" (Corner, 2006, p. 24). These strategies will be examined further during the discussion of design goals in Chapter 9.

People and Ecological Urbanism: Community Engagement

According to ecological urbanism those who inhabit a site create and are part of the environment as much as the physically occurring features. Human experience of and behavior in a specific space matters (Burgess, Harrison, & Limb, 1988).

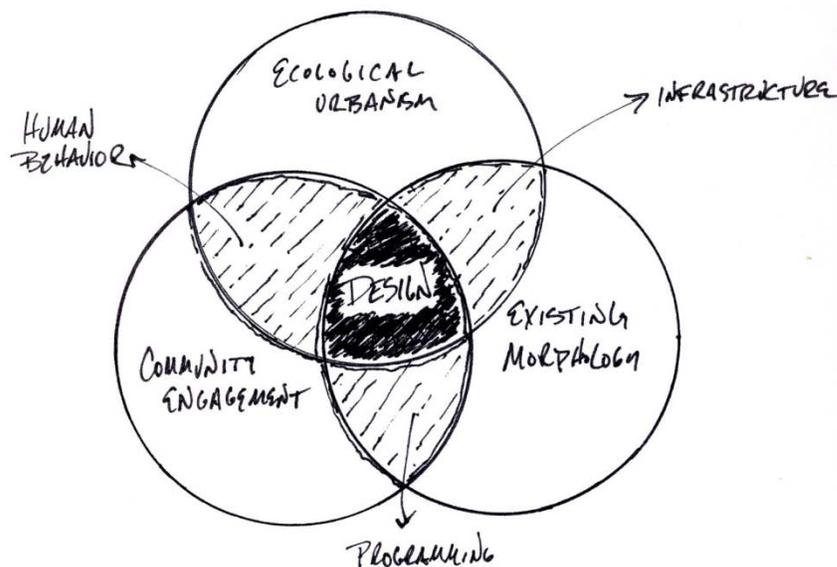


Figure 1: Conceptualizing the relationships between influences on design development

This notion is not new. Jane Jacobs and William Whyte explored human behavior and design in urban spaces systematically from the mid-20th century (Jacobs, 1961) (Whyte, 1980).

The process of community engagement is intended to permit community members and designers to interact and communicate regarding expectations, needs, desires, and concerns of the community. For the designer, community engagement serves as an opportunity to add information beyond what can be gathered from observation. This tool can serve a dual purpose: the designer can gain insight to community needs, opportunities and constraints; and the community can access design information and education while influencing the process. As Juarez and Brown point out, involving the community in the design process is now generally assumed (2008). But the who, how, and what of the community involvement continues to concern landscape architects and the communities they serve (Juarez & Brown, 2008).

While the dynamics between professional and community must be addressed, community engagement still provides one form of insurance against losing important spaces and functions (Kwinter, 2010) (Ross & Leigh, 2000). Community members not only act as a resource for understanding the broader functions urban spaces serve, but provide the design process with a set of needs and values to act as guides. The design can then grow out of a community vision. Community engagement takes many forms (Lawson, 2005), and the design

products may differ, but designers gain site knowledge in this format that might not be otherwise gained.

When the design goals for something as specific as stormwater management grow out of a community engagement process that identifies community needs and concerns, the designer is essentially given the materials with which to work. Rather than limiting, this specified palette encourages creativity that builds upon the ideas of community members. It permits a certain fearlessness as the designer can trust what the community has given to her. As the design process proceeds, the community members see themselves in the design goals and solutions, and they take ownership of the design, not just the ideas behind it.

For this thesis, the designer pursued a method of community engagement based on *Design Charrettes for Sustainable Communities* (Condon, 2008). The full charrette model was not appropriate in this case. Instead a more organic interaction that followed the lead of community members was in order. This resulted in two large community meetings, three smaller neighborhood working group meetings, four community leader meetings, twenty-seven informal interviews with community leaders, stakeholders, and residents, and finally three neighborhood walks with residents provided the designer with significant community input.

Why Urban Stormwater

Considering stormwater within an ecological urbanism context changes the primary goal of the storm water intervention from removal or dispersion to

infiltration, cleansing, storage and re-use. When stormwater can provide accounted for benefits in a neighborhood such as tree watering, car washing, beautification, employment, etc., stormwater begins to be perceived as a potential resource rather than a liability.

However, in researching stormwater management in highly urbanized areas, the impervious cover model reveals the correlation between impervious cover and water quality. The Revised Impervious Cover Model could leave those concerned with stormwater in highly urbanized areas wondering whether there is any hope. (Schueler, Fraley-McNeal, & Capiella, 2009). Streams are impacted at 10% IC and are non-supporting at 25% IC. An urban neighborhood with more than 90% IC must be hopeless, right?

No. Why? First of all the goals are different—urban neighborhoods may not be the solution to water quality, but they do offer profound opportunities to reframe stormwater as a resource. Second, stormwater fees based on IC are looming in Maryland. HB987, passed by the Maryland General Assembly on April 12, 2012, requires that each Phase I MS-4 permitted jurisdiction (which include Baltimore City) to set up a Local Stormwater Fee and Watershed Protection and Restoration Fund by 7/1/2013. Urban neighborhoods will need to address their IC just like all other properties. And with such high IC, urban areas may be logical locations to seek opportunities for increasing pervious surfaces, tree canopy, rain gardens and green space in general. Clearly, urban areas will not be transformed into functional

forests or prairies, but carefully designed interventions can serve important stormwater mitigation purposes while meeting broader community needs.

Here it is important to make a note about Environmentally Sensitive Design. ESD is defined by the Maryland Department of the Environment and the 2007 Stormwater Management Act of 2007 as “means using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources.” (Stormwater Management Act of 2007, Title 4, Subtitle 201.1(B). According to this definition, only some of the interventions used could be classified as ESDS; the majority would fall under the LID or retrofit category. For the sake of clarity, throughout the thesis all storm water interventions will be referred to by their specific type, name (for example: bioswale or rain garden) or generally as storm water design interventions.

2

Research and Design Process

The designer used site observation, human use and behavior observation, sketching, diagramming, ArcGIS, community engagement, and aerial maps and photos to complete a detailed site analysis. Site observation and community engagement involved significant on-site experience. The designer benefited from living within 5 miles of the site and was able to travel to the site frequently. The designer visited the site an average of twice a week during the study period. The design process was iterative: each technique or method and its results were revisited multiple times in order to incorporate or address new information. The overall design process included community engagement and site design practices and adhered to the following basic structure:

- Research (readings, precedents, case studies)
- Site Visits and Observation
- Stakeholder and Resident Interviews
- Site Analysis
- Community Workshop and Working Group Meetings
- Design Goals; Location of Site Interventions
- Concept and Design Development Programmatic and Neighborhood Master Plan
- Detailed Site Plans for Focus Areas
- Community Response
- Design Edits

The research design process diagram (Figure 3) illustrates the iterative

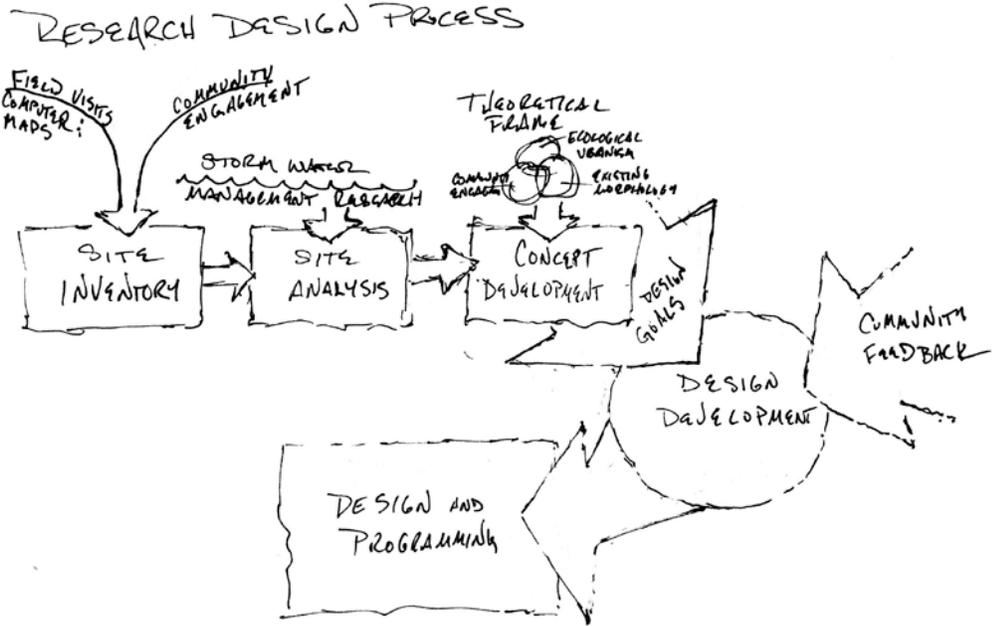


Figure 2: Research Design Process

research and design process. Chapters 4-8 discuss the particular community engagement processes and their role in informing the design process in more depth. As much information from the early chapters is the result of site observation, a brief discussion of site visits is in order.

Site visits began with collecting a site inventory of the neighborhood through walking and driving the site, taking notes, photos, and sketching as a means to understanding the physical experience of McElderry Park neighborhood.

The designer made every effort to visit at various times of day and during storm events. Overtime, site visits had specific purposes, such as exploring viewsheds, potential site locations, vehicle and pedestrian patterns, etc. Because of crime related concerns, the designer did not visit on foot late at night (after 10pm). However, several night visits were accomplished via car in order to determine whether and how the neighborhood changed after dark. Information gathered from the site visits is covered throughout Chapters 5-8. Both the physical features and the related cultural and social factors of the site are examined and analyzed. While drawing conclusions and making assertions that impact potential design decisions, no moral judgment is implied or intended.

3

Precedents

The following precedents provide the designer with specific tools, frameworks, and inspiration for designing in urban spaces. While all of the case studies present aspects of ecological urbanism some are more focused on community engagement and some have a stronger storm water component. Three of the case studies are Atelier Dreiseitl's Arkadien Asperg Village and Tanner Spring Park; Gowanus Canal Sponge Park, by dlandstudios, ECOBox/Self-Managed Eco-urban Network by Atelier d'Architecture Autogeree, and Bankside Urban Forest by Witherford Watson Mann with Ken Worpole.

The designer also includes two local projects, Real Food Farms and Baltimore Blue Alleys, as case studies that have programmatic as well as design implications from an ecological urbanism perspective that might apply to McElderry Park.

*Arkadien Asperger, Germany
Atelier Dreiseitl, 2001-2002*

Not far from Stuttgart, Germany, Atelier Dreiseitl had the opportunity to create a new community. This “urban village” utilizes a variety of ecologically friendly strategies for living, from passive solar heating, to underground parking. Many of the amenities could not be implemented as retro-fits, but even so the development stands as a magnificent example of what can be achieved, from an ecological soundness perspective, in high population density areas. Most relevant to McElderry Park’s Stormwater Master Plan are the stormwater management elements. The design program includes rainwater harvesting and recycling for grey water uses.

As can be seen in the master plan, water acts as a connecting design element while serving functional, ecological purposes. The trail designs, plantings and



Figure 2: Arkadien Asperger Master Plan
(from: www.atelierdreiseitl.com)



Figure 4: Waterway and Path, Arkadien Asperger
(from: www.atelierdreiseitl.com)

materials choices, reiterate and celebrate the role of water in the community.

Tanner Springs Park, Portland
Atelier Dreiseitl and Green Works PC, 2002-2005

Another of Atelier Dreiseitl's projects, Tanner Springs Park is a park which handles storm water. Natural plantings mix with lawn planted stadium seating--all of which reach down to the water. A required fence became site specific art designed by Dreiseitl himself. (Atelier Dreiseitl, 2011) The mix of natural and industrial materials along with angular and flowing forms point to the juxtaposition the park is: a point of natural process in an urban locale.



Figure 5: Tanner Springs Park, Seattle (from: www.atelierdreiseitl.com)

Few sites in McElderry Park are as large as the Tanner Springs site, but important design lessons can be drawn: unique seating options, clear sight lines for safety, creating art from necessary structural features. Conceptually, the notion of

appreciating and playing with the mix of natural and urban morphologies seems ripe.

Gowanus Canal Sponge Park, New York City
dlandstudio

The existing site photos of the Gowanus Canal on dlandstudio's website reveal the ecological deterioration of the Sponge Park site. dlandstudio's design cleans the run-off and canal water through a series of wetlands that permit plants to absorb contaminants (Figure 6). The new hydrology also helps avoid combined sewer overflows. dlandstudio takes an environmental concern, the polluted canal, and turn it into an ecological and cultural resource.(dlandstudio, 2011) The park cleans water and it provides access to a new water landscape, and in so doing benefits residents and other stakeholders. The ecological properties of the park, which aim to clean the highly polluted water of the Gowanus Canal, can serve as precedents for the McElderry Park site. The designer also wants to address how the Gowanus Canal Sponge Park project embodies ecological urbanism principles from a project development and planning stand point. Collaboration with city agencies, the Gowanus Canal Conservancy, private developers, and historic preservationists have resulted in.

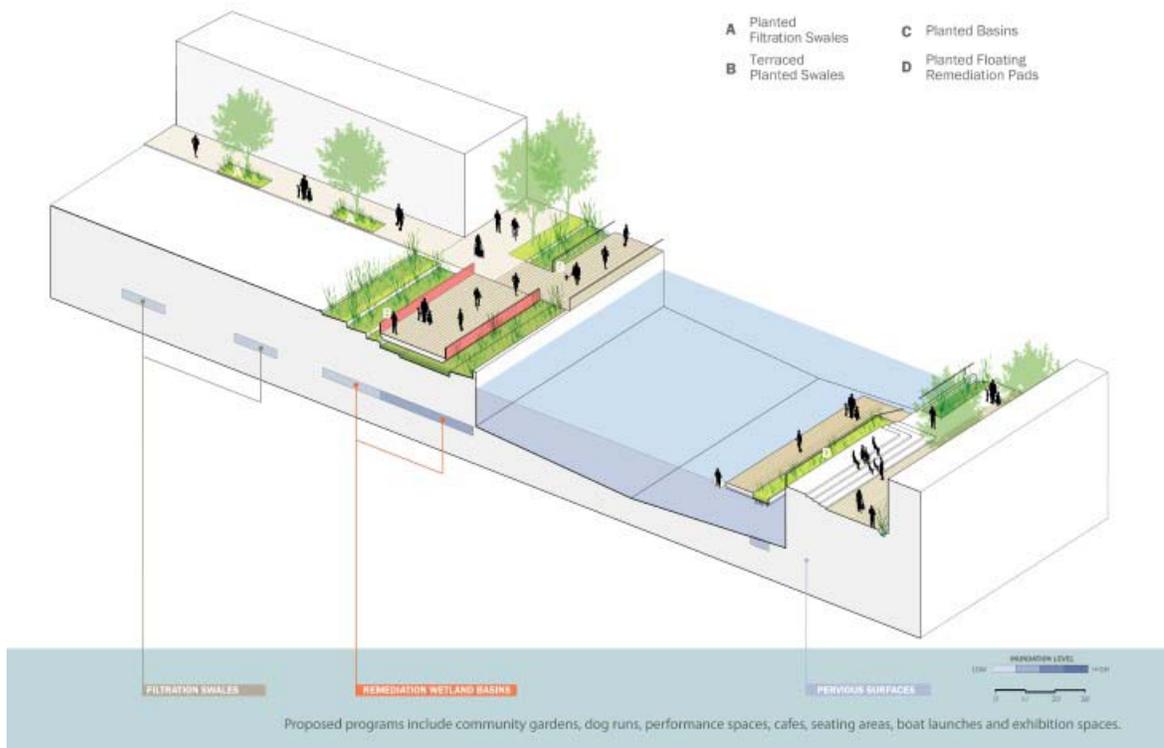


Figure 6: Detail from Proposal for Gowanus Sponge Park

multi-faceted design that not only addresses the environmental concerns of the polluted waterway, but those of the broader community as well (Daily, 2011). The canal now has a 40 foot public easement along the water's edge, where passive water recreation combines with cultural preservation and hydrology to in a unique ecology where water is cleaned, habitat is created, and the local economy is supported.

*ECOBox/Self-Managed Eco-urban Network, Paris
Atelier d'Architecture Autogeree*

ECOBox began in 2001, originally with the aim of utilizing what AAA called “temporary misused or underused spaces.” The goal was for the projects to be self-managed by the residents and those who used them, but the flexibility of

these spaces and the reversibility of the programming are the fundamental aspects. These pillars “preserve urban ‘biodiversity’” according to AAA, “by encouraging the co-existence of a wide variety of life-styles and living practices.” project has expanded and moved three times. Multiple partners now participate in “curating” the ECOBox gardens (Ateleur d'Architecture Autogeree, 2000-2008). The interstitial spaces which ECOBox claims and activates immediately resonate with McElderry Park’s spatial conditions. The Baltimore neighborhood has misused alleys, vacant lots, and empty houses all waiting for the breath of life that an ECOBox like action would bring.



Figure 7: Eco-Box in Action(From <http://www.urbantactics.org/projects/ecobox/ecobox.html???>)

Broader lessons can be drawn from the ECOBox project for McElderry Park. The collaboration between a committed design focused non-profit and the residents, the emphasis on flexibility and reversibility, the variety of activities welcomed in the space, the impact project had on the surrounding community (Figure 8). The manner and type of programming were more

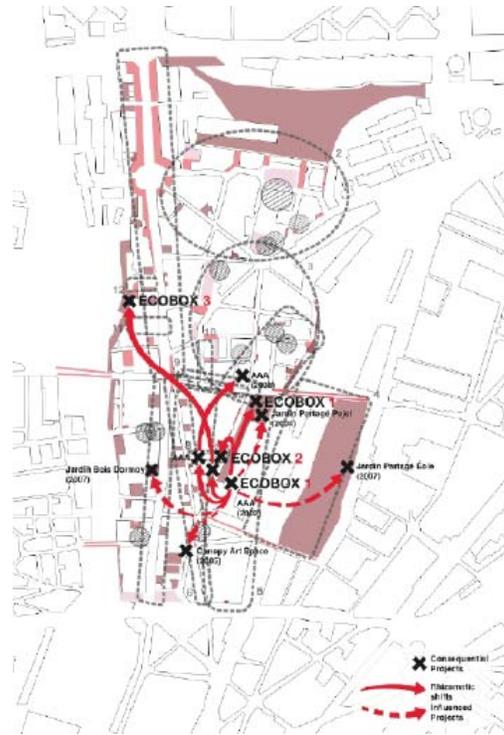


Figure 8: Eco-Box Plan reveals relationships (From <http://www.urbantactics.org/projects/ecobox/ecobox.html>)

important that the location and existing form of the space. Because the programming and the physical features that supported it could move, ECOBox has shifted locations as necessary.

For McElderry Park, this notion could be seen as an important opportunity for pre-development programming of spaces. Rather than waiting for “nuisance” areas to have a permanent design solution, an ECOBox model could be adopted. The community will then have an activated space that functions according to their own expectations. One drawback in the McElderry Park community is that community members are not as likely to welcome the “messiness” of the ECOBox aesthetic. Other design options would need to be explored.

Bankside Urban Forest, London
Witherford Watson Man with Ken Worpole

This project takes its cues from the existing built structure of winding streets and meandering waterways. Rather than taking over space with a placed park, the designers grow a forest in a pattern that fits within the urban patterns. The forest does serve to re-connect the neighborhood to the river, but in a subtle and organic manner. The Bankside Urban Forest proposal is more than a “tree planting or soft-landscaping scheme,” however. Worpole notes this, himself and states that the forest proposal acts as a strategy that is not based on “centre-periphery spatialities and economies, but on equitable networks of livelihood and exchange. It embodies many historic associations with freedom and social justice,” (Worpole, 2007). The forest acts a framework in which members of the Bankside community can work to create shared spaces and ideas about their neighborhood. Beyond the introduction

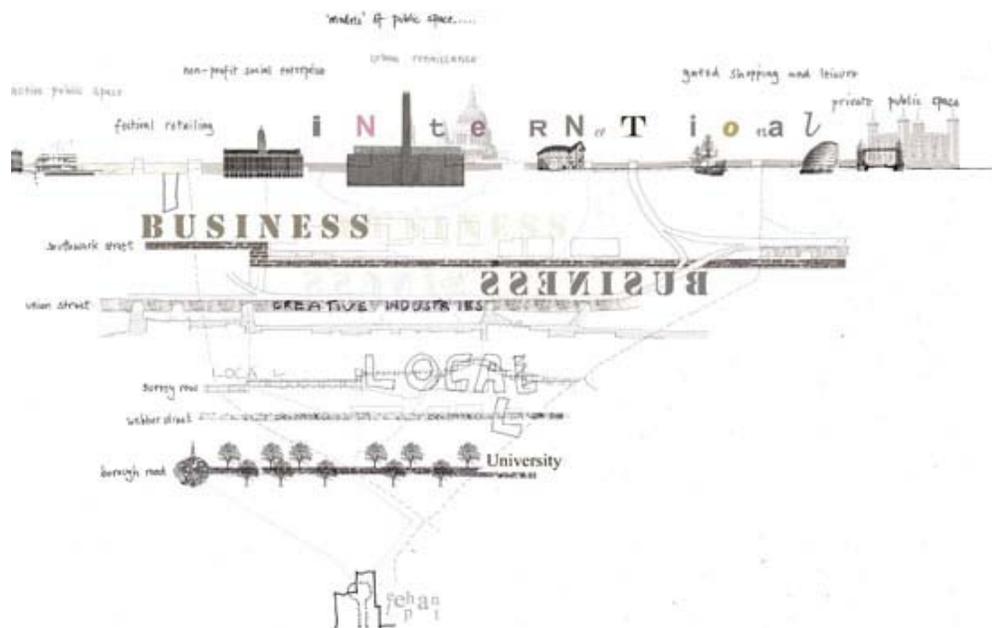


Figure 9: Bankside Forest Conceptualizing Relationships (From: http://www.wmarchitects.co.uk/Downloads/Bankside_Urban_Forest.pdf)

of the forest network, it presents the following principles:

1. Increasing the opportunities for ‘sharing’ – that the existing social and physical relationships between the local ‘urban interior’, and the rapidly developing edges within Bankside and Borough, are supported and reinforced through significant improvements to the public realm and local amenities, and by increasing the opportunities for social engagement.

2. That the Urban Forest is the characterization of this distinctive area of London, based upon the existing spatial qualities that underpin the area’s identity; meandering streets, multiple routes, clearings, clusters of vaulted and canopied spaces.

3. That evolutionary change takes place in a coordinated (not piecemeal) way, meshing existing projects and initiatives

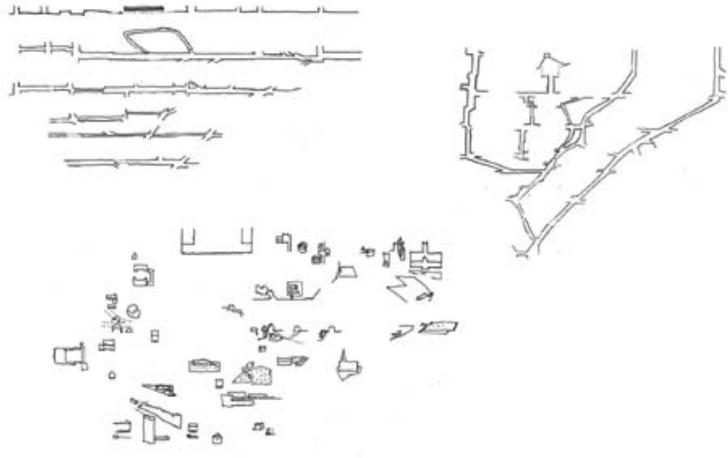


Figure 10: Street, Streams, and Open Spaces (From: http://www.wmarchitects.co.uk/Downloads/Bankside_Urban_Forest.pdf)

with new opportunities. Bankside Urban Forest must engage and sustain the commitment of the diverse individuals and groups in the area to take ownership of the projects over the long term.

4. That an ecological approach to urban regeneration based on networking, self-sufficiency, and ‘economies of small-scale’ will create a new sense of urban equilibrium between contrasting economic, social and cultural groups.

5. A collective project based on shared principles – that the Bankside Urban Forest establishes a new model for regenerating the public realm in London to attract significant public and private partners and investment(Witherford Watson Man, 2008).

***Real Food Farm
CivicWorks, Baltimore, MD***

While this precedent is not a design project per se, it addresses the urban ecology that exists in Baltimore with both built structures and programming. Having identified the need for access to fresh produce in the neighborhoods surrounding Clifton Park, in east Baltimore, the Real Food Farm, has taken over a southeast field of Clifton Park and introduced food producing gardens and hoop houses. Sensitive to the site’s proximity to Clifton High School, the farm, hosts extensive education outreach programs and has multiple paid internships for high school students. Real Food Farms has also provided jobs for local residents and takes its role in the local economy seriously; assuring that EBT payments are accepted at its local markets.

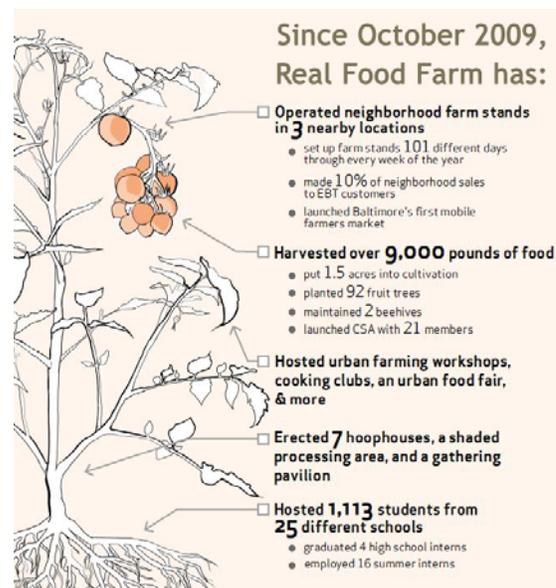


Figure 11: Real Food Farm Facts (From: <http://www.realfoodfarm.org/about/project-goals/>)

Finally, Real Food Farm partners with a variety of local organizations to achieve specific goals: it works with MICA students to develop appropriate marketing and design moves; with local watershed groups to minimize run-off; and

with other urban agricultural programs in the city to reach a broad audience and assure fresh affordable food for everyone. (Real Food Farms, 2011)

Baltimore Blue Alleys
Blue Water Baltimore, with others, Baltimore, MD

Sponsored by the Department of Fish and Wildlife Management, the implementation of the Baltimore Blue Alleys will be overseen by Blue Water Baltimore, the regions watershed association. Two neighborhoods, Patterson Park and Butcher's Hill, which are both within a quarter mile of McElderry Park, will be sharing the \$600,000 grant. They will create one pervious alley in each neighborhood in which water can infiltrate. Both pervious pavers and plantings will be part of the design. While technical specifications and plans are not available at this time, the President of the Patterson Park Neighborhood Association expressed a strong belief that this will serve as a pilot project in the southeast Baltimore area, and that other alleys will follow. Because alleys have a difficult history in these neighborhoods, several neighbors and community leaders are positive about the potential of this new and visionary role for alleys (Personal communication: Ashley Trout, Blue Water Baltimore, March 26, 2012).

4

Site Selection and Context

McElderry Park is an 89.9 acre neighborhood in southeast Baltimore within the Inner Harbor subwatershed of the Chesapeake Bay watershed.

This chapter situates the site in its broader context by physically locating the site and outlining site selection; introducing geography and hydrology at a regional and city level; providing brief historical points of reference for the neighborhood, including the neighborhood's historical watershed; and outlining the policy environment in which such a discussion is occurring.

Why McElderry Park?

The designer chose the McElderry Park neighborhood on Baltimore's southeast side for three reasons:

1. It is an urban row home neighborhood in Baltimore City, allowing for proximity and ease of study.
2. McElderry Park is composed of 97 percent of impervious surface (according to Schueler, et al. 2009, IC greater between 25-60% is un-supporting, and over 60% he calls urban drainage).
3. The neighborhood has an active Neighborhood Association and other involved entities permitting the designer access to community members.

In short, McElderry Park offered the elements of a highly urbanized neighborhood along with ready access to community members. Proximity assured ease of site visits.



Figure 12: Baltimore City and McElderry Park (Aerial from Google Maps; Graphics by author)

Geography and Hydrology

Baltimore straddles the Fall Line, where the rocky-clay soil and oak-hickory forests of the Piedmont give way to the pine forests of the Coastal Plain. A port city from the outset, Baltimore sits at the confluence of three still existing rivers: The Jones Falls runs into the Inner Harbor which joins the Patapsco River after it has

already met the Gwynn Falls River. Flowing into the Chesapeake Bay, the Patapsco is influenced by tides and brackish water; however, the pollution levels keep it from functioning properly as a healthy estuary.

Baltimore receives an annual average of 41.88 inches of precipitation (NOAA, 2011). The city currently divides itself into 9 subwatersheds

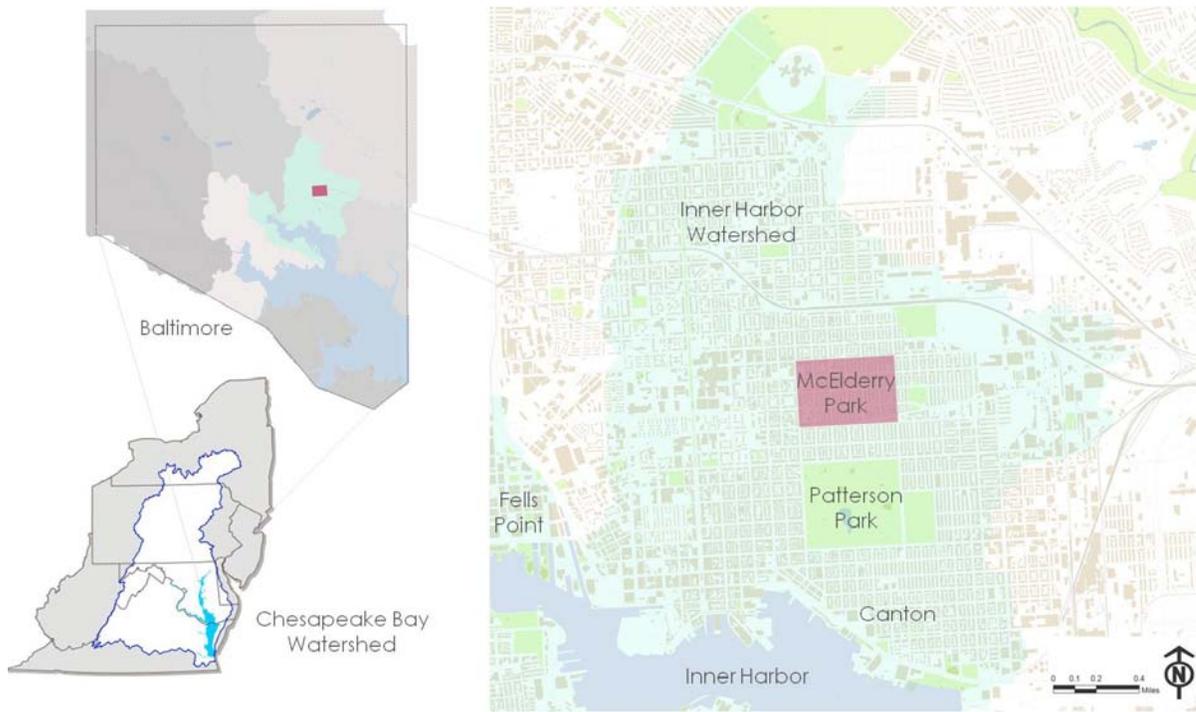


Figure 13: Baltimore and McElderry Park Watershed Context

(Figure 13). Blue Water Baltimore is the city's primary non-profit advocate for watershed care-taking (Blue Water Baltimore, 2011). The organization focuses on a wide variety of activities from educational outreach to the maintenance of a native plant nursery. As part of the Chesapeake Bay Watershed, Baltimore is part of a multi-state region program called the Chesapeake Bay Program responsible for improving water quality in the Bay (Chesapeake Bay Program, 2011). Blue Water

Baltimore works in conjunction with other regional watershed organizations to coordinate clean-ups and general efforts.

Trees also impact stormwater quality. In Figure 13, the urban core of Baltimore is readily apparent, just by looking at the tree cover. Because the city grew out from the ports, the densest areas of the city are near the water. The adjacency results in little to no infiltration of stormwater runoff near the harbor. The aerial also clearly depicts the lack of tree canopy in the urban core. Fingers of UTC (urban tree canopy) reach into the city as they follow rivers or streams, but their paths are narrow and limited. As higher UTC plays an important role in improving the quality of storm water runoff (Schueler, Fraley-McNeal, & Cappiella, 2009), Baltimore City's UTC of approximately 20% (USDA Forest Service Northern Research Station, 2009).

Within the city, McElderry Park belongs to the Inner Harbor watershed. All water from this watershed flows directly into the Inner Harbor; it is not conducted via a river or stream, but channeled directly from the storm drains (Figure 14). McElderry Park has over 97% impervious surface. This consists of 31 acres of roof, 28 acres of streets, alleys and parking lots, and 28 acres of sidewalks and paved over backyards. Rather than infiltrating into the ground, the majority of all storm water runs off roofs, down alleys and streets into storm drains and into the Inner Harbor. As of fall 2011, there is no monitoring of the pollutant load of the water from this sub-watershed entering the Inner Harbor at the outfall (Center for Watershed Protection, 2012). There is, however, a garbage catchment device. This

captured “upwards of 5 tons” of garbage each month in 2010 (Wheeler, 2001). Based on monitoring in other Inner Harbor locations, EcoCheck, in conjunction in the University of Maryland Center for Environmental Sciences, has failed the water quality of the Inner Harbor for as long as it has been monitoring it (EcoCheck, 2011).

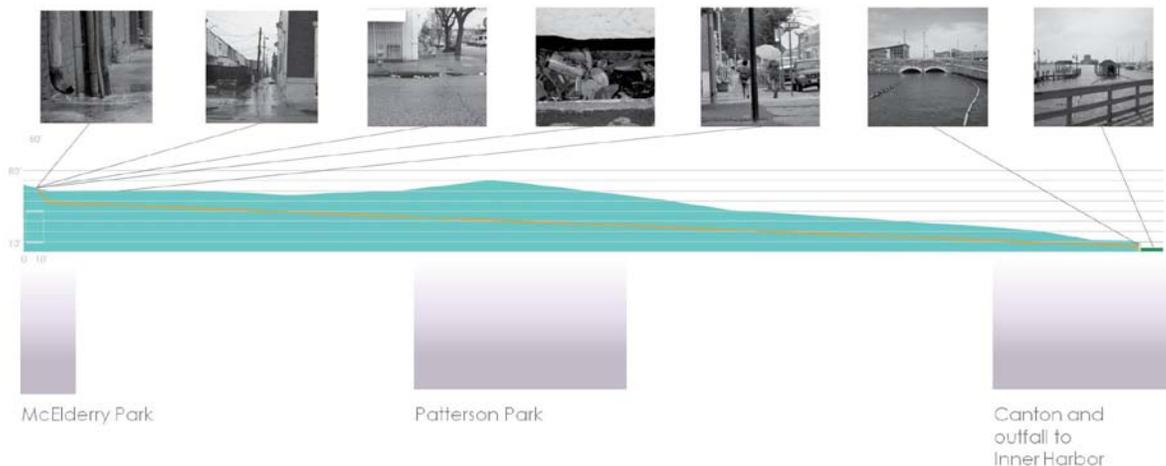


Figure 13: Stormwater Path from McElderry Park to Inner Harbor

History

The many threads of Baltimore’s rich and complex history cannot begin to be enumerated here. In the time line side bar, chosen historic markers are pertinent to the development of McElderry Park and the broader city context.

1797 – Baltimore is incorporated as a city (Baltimore Then and Now—p.5)

1800–Baltimore becomes 3rd largest US city by population after New York and Philadelphia (Baltimore in the Nation, 1789-1861)

As this is a thesis ultimately proposes changes to the urban fabric, understanding the impacts

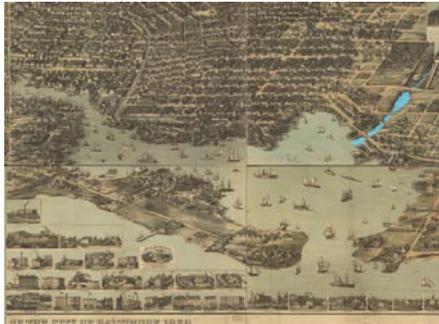


Figure 15: E. Sacshe and Co. 1898 Map of Baltimore City with Harris Creek River in Blue

of past changes to the city merits some attention. It is not the purview of this thesis to do a historical analysis of past developments; however, two such changes are pertinent to the McElderry Park neighborhood and in some ways bookend the neighborhood's current state. First, is the culverting of the Harris Creek River for development. Running along the east side of what is now McElderry Park, this relatively short river was deep enough in the 1800s to serve a ship building location. (Bahr, 2011). Putting the water below the

1827–Baltimore & Ohio Railroad begun (Baltimore Then and Now—p.5)

1890–Maryland Steel (later Bethlehem Steel) opened on Sparrow's Point

1880-1910–The Industrial Revolution brings tremendous millwork to Baltimore—everything from textiles to flour ship from Baltimore's port (Baltimore and the Nation)

1904–The Great Baltimore Fire (downtown) (The Great Baltimore Fire—p.15)

1910-1930s–Row homes in McElderry Park built, primarily occupied by Central and East European immigrants

1920-1970–Banks, developers and officials collude in blockbusting; white flight to suburbs (Blockbusting in Baltimore: The Edmonson Village Story, p. 73)

1960s–Bethlehem Steel (along with other pre-war industries) decline

1980s–McElderry Park experiences white flight (likely related to the loss of Bethlehem Steel jobs) (Mr. Street, Mr. Ross, CityPaper)

ground certainly provided increased real estate for the city to grow. However, it transformed the landscape and hydrology of the area profoundly. It is impossible to know how the neighborhood would be were there a stream along the east side today; suffice it to say that it would be different. Instead of the residents unknowingly walking on water as it flows in pipes under their feet, they could be deliberately embracing it.

The second major development that transformed McElderry Park is recent. It has

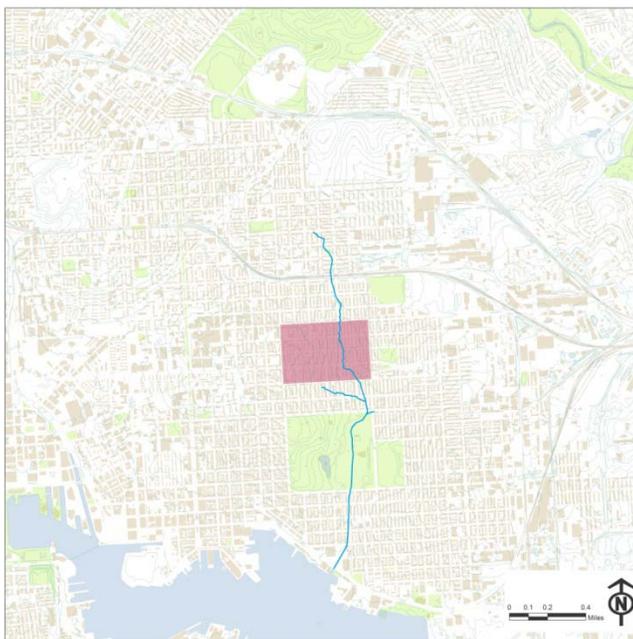


Figure 16: Historical Path of Harris Creek River

1994-2000–HUD closes 5 large Baltimore housing projects increasing population of Section 8 renters in McElderry Park (City Paper, Mr. Ross)

1980s-2005–Increased crime rates (Mr. Ross, Baltimore CityStat, CityPaper)

2003–East Baltimore Development Inc. formed to managed the New East Side development project (a collaboration by Johns Hopkins, Baltimore City, Annie E. Casey Foundation and several private developers)

2006–Monument - McElderry - Fayette Neighborhood Revitalization Plan developed in response to EBDI in an effort to assure that current residents would not be moved by any development plans in the future (MMFNRP)

2010-2011–Habitat for Humanity, MICA, Banner Neighborhoods, Baltimore Tree Trust embark on community investment projects in McElderry Park. Several other large scale community investment projects occur in adjoining neighborhoods. (Elizabeth Myers-Edwards, Jill Jonnes)

only been four years since the nearby East Baltimore Development Inc. project in conjunction with Johns Hopkins University, Baltimore City and others, acquired and tore down row homes in the adjacent Middle East neighborhood through the use of eminent domain. Views of the EBDI project vary: some see it as a “comprehensive renewal plan” for neighborhood renewal; others perceive it as a land grab by Johns Hopkins (Save Middle East Action Committee and Art on Purpose, 2009, p. 7 & 28). Regardless, the process through which neighboring residents were moved out their homes put the McElderry Park community on the offensive. In the Monument–McElderry–Fayette Neighborhood Revitalization Plan, the community focuses on retaining affordable housing and states unequivocally that it will tolerate: “No forced relocation of any resident” (The Monument-McElderry-Fayette Community, 2006, p. 3).

Social and Economic

Land use specific to the neighborhood will be examined in the Site Inventory and Analysis chapter that follows, but it is useful here to consider some basic demographic information of residents in McElderry Park and how this data compares to Baltimore City in general. On several measures, McElderry Park tracks Baltimore City, but significant differences arise in population density, percent of female headed households, and the percent of population with less than a high school education.



Figure 17: Data from 2010 Census

Stormwater Policies and Public Awareness

Several recent policy developments bode well for increased focus on watershed issues: President Obama’s May 2009 Executive Order directed attention to the water quality of Chesapeake Bay; Baltimore, like all large cities with MS-4 permits¹, submitted a Watershed Implementation Plan to meet Total Maximum Daily Load as required by the U.S. Environmental Protection Agency; a public/private initiative in Baltimore City called Fishable, Swimmable, Healthy Harbor by 2020 is taking water quality goals seriously, funding water quality assessments and other projects; Blue Water Baltimore, the city and region’s watershed association, is working with the Center for Watershed Protection to create Blue Alleys in two Baltimore neighborhoods both of which are within walking distance of McElderry Park.

¹ These permits cover municipal sources of pollutants in water under the National Pollutant Discharge Elimination System (NPDES) For more information see <http://cfpub.epa.gov/npdes/>.

One reason a spotlight has been placed on Baltimore's ecological problems, such as the water quality in the Inner Harbor, is the increased awareness that urban environments can impact public health. Of particular concern to McElderry Park residents are the health issues related to childhood asthma and obesity. The Baltimore Tree Trust in coordination with the McElderry Park Neighborhood Community Association is embarking on the Trees for Public Health project in an effort to bring 800 street trees to the neighborhood while studying the social and health outcomes for the residents.

Figure 18: EcoCheck's Chesapeake Bay Report Card (From: <http://ian.umces.edu/ecocheck/report-cards/chesapeake-bay/2010/>)

Development Context

Baltimore City learned the value of waterfront property with the Inner Harbor development in that took place from the 1960s to the 1980s. Beginning with the Charles Center by RTKL, the Committee for Downtown saw development as a way to reverse Baltimore's decline. The Charles Center development utilized already existing structures, keeping much of the 33 acre development's fabric intact. From there, new development near the water included, shopping centers, parks, residences, offices, the National Aquarium and the Maryland Science Center, water taxi services, the conference center as well as the sports stadiums. All tourist destinations became centered on the Harbor and the development was considered a success as other developers sought land nearby (Millspaugh, 2003) (Copp, 2011).

While McElderry is only a mile and a half from the Inner Harbor, it has not experienced any of the benefits from these developments. There may be a variety of reasons for this; however, the proximity to the water deserves to be explored.

Several plans at the city, neighborhood, and other scales may impact McElderry Park. These plans range from the City to the State level. They provided regulatory guidance as well as previously proposed design frameworks within which to consider a stormwater management plan for McElderry Park.

*Baltimore City's Comprehensive Master Plan*²

Rather than identifying specific sites for development, the Comprehensive Master Plan 2007-2012 lays out goals and strategies. Some of the particular areas of concern that may apply to McElderry Park are: encouraging development of city-owned vacant row homes and funding prioritization of particular development zones or projects which include the JHU-EBDI development just to the west of McElderry Park (City of Baltimore, 2006).

Baltimore's New City Zoning Code and Landscape Manual (Department of Planning, Draft 2011)

Issues of primary concern that will impact site design in McElderry Park are new zoning designations regarding use, planting unit standards, and city permitted trees (for public land). The Landscape Manual makes clear that where overlapping standards may apply the more stringent design standards are required (Department of Planning City of Baltimore, 2011).

*The 2009 Baltimore Sustainability Plan*³

With 29 specific goals in categories ranging from transportation to resource conservation, the Baltimore Sustainability Plan outlined numerous strategies for how the city, citizens, business, and organizations could help Baltimore reach its goals. While this plan lacks site-specific development, it does observe the importance of community-based decisions as an important factor in sustainability.

² "Live Earn Play Learn," Baltimore City Council and Planning Commission, 2006

³ Department of Planning, Draft 2011

The plan also impacts potential design decisions. In the case of McElderry Park, community stakeholders can demonstrate how their new vision helps the city achieve its goals (Baltimore City, 2009).

Southeast Baltimore Complete Streets Plan⁴

This plan's goal is to identify certain streets which can serve multiple roles (bike, traffic, commercial, etc.) and propose re-designs for later implementation. One strategy briefly mentioned is the inclusion of stormwater management techniques as a complete street approach (Baltimore City Department of Transportation, 2011, p. 34). However, this strategy lacks stormwater design details and specific design approaches for the McElderry Park neighborhood.

The Monument-McElderry-Fayette Revitalization Plan (2006)

Proposing a wide range of strategies for addressing issues of concern in the community, the plan also presents site specific designs. The plan was developed in response to the EBDI development in conjunction with JHU to the west of the neighborhood. The residents saw this plan as an opportunity to determine their own destiny. Much of the plan focuses on neighborhood desires, such as job training, day care, and improved technological access. The plan also identifies the need for a full service grocery store and provides a suggested design for Library Square.

Since 2006, little movement has been made on implementing anything from the plan (Myers-Edwards, 2011)(Wirth, 2011), however, it remains a source of

⁴The Department of Transportation, Baltimore City, Draft 2, 2011

valuable information regarding the area from 1990-2000. Finally, it underlines an important community value which remains today: no person should be moved from their home through the use of eminent domain. Ideally, the community wishes to see each and every row home renovated and owner occupied (The Monument-McElderry-Fayette Community, 2006).

While some of these plans have a time horizon of several years and are only in the draft phases, the designer considered them as part of the site analysis. The master plan presented here does not significantly impinge on any of these plans; however, the designer reserved the right to address particular issues differently.

5

Neighborhood Stormwater

This chapter examines the existing site in regards to stormwater, with a focus on topography and surface flow, impervious surface area, garbage, and urban tree cover. When necessary, methodology is discussed.

Topography and surface flow

McElderry Park's natural topography is like that of bowl cut in half—clearly reflecting the river that once ran through the area. Were it not for the streets and buildings stormwater would flow directly to the low point of the neighborhood (Figure 19). The streets interrupt the topography of the neighborhood and as was

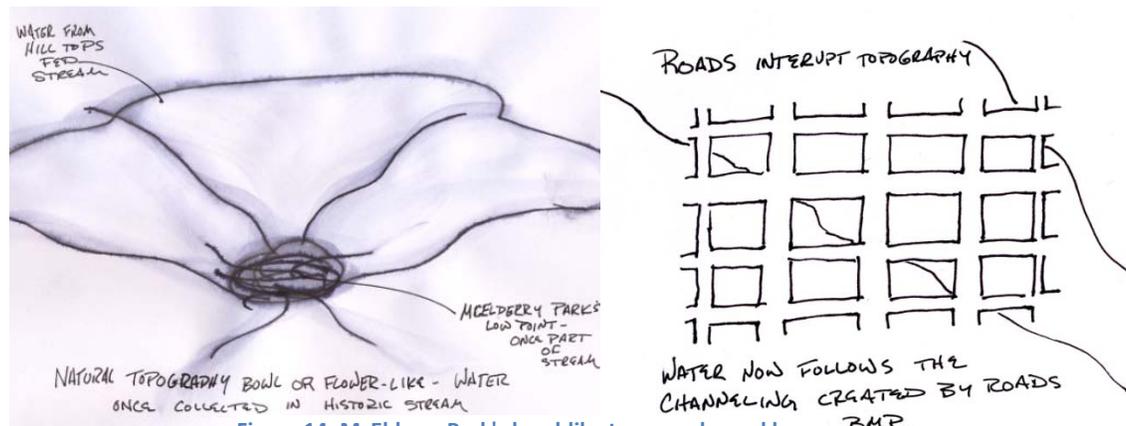


Figure 14: McElderry Park's bowl-like topography and how roads interrupt the topography . B.M.P.

intention when the storm drain system was built (between 1910-1940), the streets and curbs channel the water quickly away from private property. While the streets do not fill with water, they are where the water goes: the streets act as the canals of McElderry Park. Given that there are not major flooding issues in McElderry Park,

one could argue that the existing storm water management system works (one failure was Hurricane Isabel) (McPhee, 2012). It moves water from the neighborhood as quickly as possible. Storm drains capture runoff in McElderry Park and convey it via underground pipes directly to the Inner Harbor. The untreated run-off outfalls at Canton's waterfront (Figure 15).



Figure 20: Existing surface water flow in relation to roads and topography.

Impervious Cover

The primary methods for analyzing McElderry Park's hydrology were site observation and GIS analysis of Baltimore City's 2008 GIS Data. Site observation included photographing topography, noting indications of water wear, and visiting

during rain events to observe run-off flow. GIS analysis included using data to determine areas of impervious surface, creating maps of impervious surface and examining relationships between impervious surfaces, topography, and storm drains. A brief explanation of the GIS methodology for determining areas of impervious and pervious surfaces follows.

The following GIS feature layers (Baltimore City Data 2010) were used in the determination of impervious and pervious surfaces: street area (polygon) which included alleys; parcel (polygon); building (polygon); parking (polygon); and park

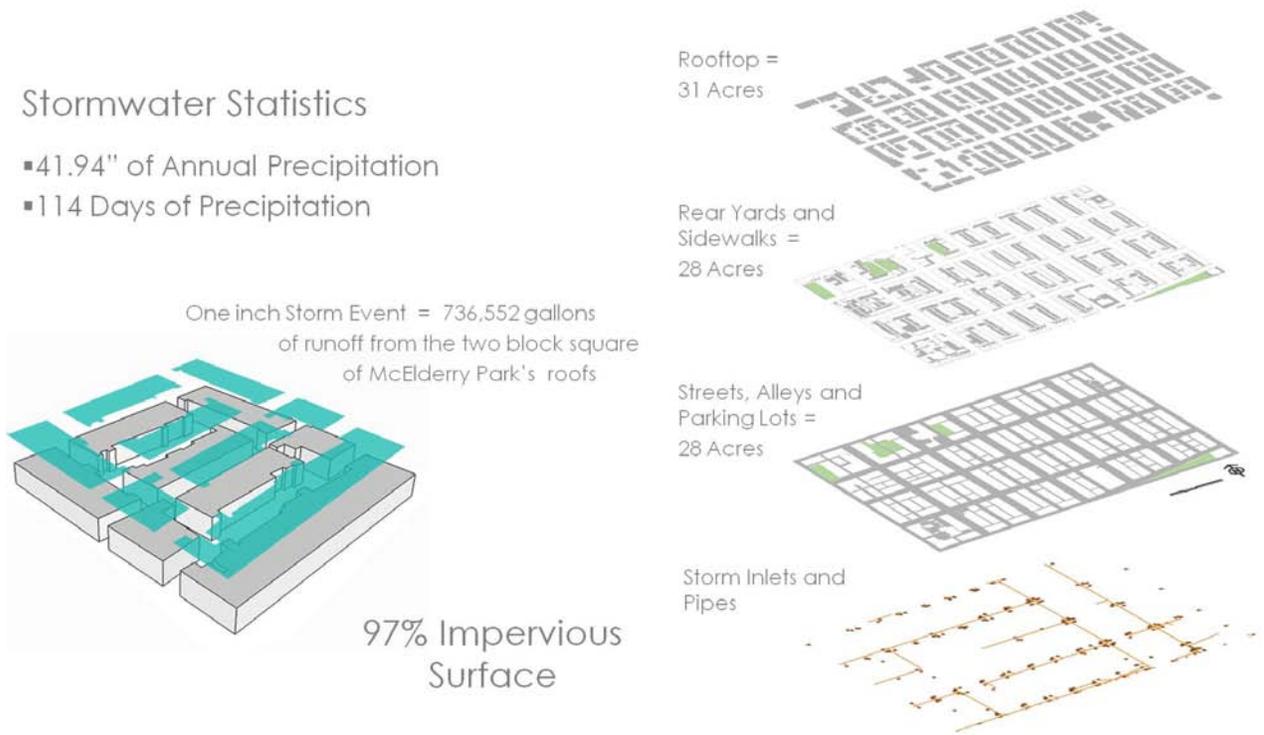


Figure 21: Basic Stormwater Stormwater Statistics and Pervious surface area (polygon) which is used as a check. The neighborhood boundary (edited by designer to match community leaders' asserted boundary, rather than city political boundaries) provided total area of the neighborhood: 89 acres. The street area layer

(edited by designer to include randomly missing alleys) provided area of impervious streets and alleys and parking lots: 28.2.

To find the impervious surface area of the roof tops, the designer took the area of the building layer: 31 acres. The neighborhood's yards or unbuilt areas are not identified in a separate layer. To determine the area of the yards and sidewalks was a simple matter of subtracting the building area from the parcel area (45.1 acres). The majority of the neighborhood's backyards consist of cement pads.

Difficulty in assessing the number arose due to safety and social issues related to walking the alleys to do field checking and high walls that do not permit a visual assessment. While some visibility was available from aerial maps of the neighborhood available via Google and Bing, the designer determined the conservative response would be to treat all rear yards as impervious surface. This resulted in a total of 14 acres.

Pervious space consisted of parks and parcels claimed by the community as garden space and was accordingly marked on a designer created GIS layer (polygon) alongside the existing parks: 2.1 acres. There is no sidewalk layer. To determine the acreage of side, the designer added the acreage of all determine surface areas and subtracted from the total acreage. Sidewalks totaled 14.4 acres.

Figures 22 through 25 provide a visual tour of the route McElderry Park stormwater follows.



Figure 22-23: Alleys serve as above ground channels to move stormwater away from homes to storm drains.



Figure 24: Trash in the flow of stormwater is swept along.



Figure 25: Stormwater (and trash) flow from alley along curb and gutter to storm drains, which can be found at most corners in the neighborhood.



Stormwater Education and Outreach

It is important to note that work is being done in the neighborhood and surrounding areas related to stormwater management and general watershed issues. Dr. Ray Bahr from the Canton neighborhood founded the Harris Creek Watershed Association in 2010, to educate residents of McElderry Park and surrounding neighborhoods about the neighborhoods' relationship to the Inner Harbor. The Harris Creek Watershed is a historical watershed that no longer exists as such. Now it is a smaller piece of the Inner Harbor sub-watershed. While the Harris Creek was culverted and has not had a physical presence in the landscape since the early 19th century, it is an important historical reference that could serve to the neighborhood to the water. The neighborhood association has sponsored many neighborhood clean ups and encouraged stricter code enforcement regarding garbage in an effort to keep garbage from ending up in the storm drains and hence the harbor. Parks and People Foundation has also begun education and outreach for the Harris Creek Watershed (Parks and People Foundation, 2011)

Center for Watershed Protection (CWP) conducted site surveys of McElderry Park and several surrounding neighborhoods in 2010 and 2011 to assess pollution hotspots and potential bioretention sites. A mapping of their results shows there are some pollution hotspots as well as areas that CPW identified as potential opportunities for bio-retention. In a meeting with the designer, CPW engineers, Sadie Drescher and Lori Lilly noted that trash is one of CWP's primary concerns for the McElderry Park neighborhood (Center for Watershed Protection, 2012). They suggested educational outreach to inform neighbors on how to contact city officials for clean-up and the dispersal of free garbage cans. One of their potential sites for bio-retention is Library Square on Fayette Street ((Center for Watershed Protection, 2011, p. 31).

While the storm drains do the work of conveying the runoff efficiently for most storm events, resident Kelly McPhee, who lives on Kenwood near the low point of the neighborhood, notes that during large storm events, water does pond on her street. According to McPhee, the DPW asserts that garbage build up is the cause(McPhee, 2012). The designer was unable to confirm with DPW regarding this specific location, however, in the designer's observation, the only drains that experienced impeded flow were those blocked with garbage. During the design period of site observation, there were no storms that created any flooding issues of note, but garbage in storm drains is unsightly.



Figure 26: Garbage filling storm drain

The designer witnessed two pedestrians toss garbage directly into a storm drain. This activity was noted as commonplace by several residents and stakeholders. According to residents the street sweeping is not always done as posted (once a week) and unfortunately, has the unintended consequence of pushing some garbage into the drains. And, of course, rain carries garbage to the storm drains.

Stormwater and Urban Tree Canopy

McElderry Parks 450 street trees provide only minimal stormwater management. The occasional street tree is located in pits of various sizes ranging from four feet by four feet to four feet by eight feet. City tree pits immediately proximate to the curb leave at least 3 feet for pedestrian circulation. The Baltimore Tree Trust commissioned a survey of the existing tree canopy. The survey report identifies tree resource structure and function. For the purposes of this design research thesis, basic statistics and the function of the tree resource are relevant.

Baltimore UTC 20%
McElderry Park 13%

City Goal (with DNR)– 40% UTC
by 2036

McElderry Park's 450 Existing Trees:

- 26% red maple, 14% Callery Pear
- Store 37.85 tons of carbon/year
- Capture 454,449 gallons of water/year
- Valued at \$875,483.00 (replacement cost)



Figure 27: Map of McElderry Park's Tree Canopy

How does UTC impact stormwater in McElderry Park? The neighborhood's existing 450 trees capture 454,499 gallons of stormwater (through canopy interception) (Clarkwest, 2011). This is less than 1 percent of the rain that falls on

the neighborhood during a 10 year design storm. Increased tree canopy means less water on the ground and therefore less water requiring infiltration, or capture.

As mentioned in Chapter 2, Baltimore City has a goal of increasing its UTC (urban tree canopy) by 50% in the next 24 years. To achieve this goal, neighborhoods like McElderry Park will play a vital role. Such neighborhoods, with low UTC and obvious opportunities for planting (e.g. empty tree pits) provide an easy place to start. Indeed, the city has supported the efforts of local residents and the non-profit Baltimore Tree Trust in its goal to plant 800 street trees in McElderry Park. The first 23 trees were planted in March of 2012.

6

Existing Morphology

The 89.9 acre area is bounded to the North by Monument Street, to the South by Fayette Street, to the East by Linwood Avenue and to the West by Patterson Park Ave. The arrows on Figure 28 show traffic direction and level of relative traffic congestion. The impact of traffic on the



Figure 28: McElderry Park--Edged by thoroughfares (background aerial image: Google Maps, January 2011) neighborhood will be more fully discussed in the next chapter.

Much of the data gathered for this chapter came from site visits. Site visits began with general inventorying of the neighborhood through walking and driving the site, taking notes, photos, and sketching as a means to understanding the physical experience of McElderry Park neighborhood. The designer made every effort to visit at various times of day and during storm events. Overtime, site visits

had specific purposes, such as exploring viewsheds, potential site locations, vehicle and pedestrian patterns, etc. Because of crime related concerns, the designer did not visit on foot late at night (after 10pm). However, several night visits were accomplished via car in order to determine whether and how the neighborhood changed after dark. Information gathered from the site visits continues to be addressed in following chapters.

Land Use

McElderry Park is home to a population of 4459, 16 vacant lots, and a 30% row home vacancy. McElderry Park is primarily residential. Commercial uses lie along Monument Ave on the north and punctuate a few blocks along Fayette Ave. along the South. Two community garden spaces exist in fenced in multi-lot areas. In summer of 2011 only one of these functioned. Institutions consist of:

- 2 elementary schools
- 1 library—Patterson Park Branch—Enoch Pratt Public Library
- 5+ churches
- 1 American Legion Hall
- 1 health clinic
- 1 pharmacy



Figure 29: Land Use

As shown in Figure 29, the neighborhood has a variety of commercial entities. However, some commercial entities operate sporadically. During the study period, at least one major business closed. Others may have, but given the hours of operation, the designer may not have noticed. The majority of commercial properties line Monument Street, but some are scattered throughout the neighborhood, particularly convenience and liquor stores.

- 9 liquor stores/bars
- 5 convenience stores
- 2 laundromats
- 5 pawn brokers/cash checking
- 1 small grocery
- 5 restaurants/carry outs
- 4 Salons (hair/nail) or beauty products
- 2 Tobacco shops
- 5 Clothing/sports shops
- 2 cell phone/computer shops
- 1 furniture store

Residents' perceptions of the built environment and commercial amenities in the neighborhood will be discussed in the community engagement section in Chapter 7. Even most commercial entities are built in row home structures. Churches stand out as notably different architecture in the neighborhood and serve as landmarks. The number of vacancies and their locations as well as the institutional presence of churches, the local elementary schools, public library branch and the neighborhood association are also important in the physical make up of the neighborhood.

In looking at the figure ground in Figure 30, the street grid and block system are hard to miss. By examining the building footprints, a pattern of mirroring



Figure 30: Figure Ground becomes apparent: long set of rows sit across from long set and short sets sit across from short.

Row Homes

Perhaps the most identifiable feature of the McElderry Park neighborhood is its housing which front the sidewalks. Sidewalks vary in width from 5 to 18 feet curb to wall. And most have three to five marble steps up to the front door.

Row home facades vary little, despite changes in material—brick, formstone, or siding, because the form is so consistent. A door and a window greet the passersby on ground level and two windows gaze down from the second floor. The occasional awning reaches over a door or window. Variations in this pattern are rare and indicate remodeling. As to the state of the facades, up keep does have visual impact. Homes in disrepair and boarded up buildings, whether they make up the majority of a block or break up an otherwise cared for block, are visible. This is due to the fact that these “homes” have broken the original row home pattern.(Wirth, 2011).

McElderry Park is home to the almost platonic form of the Baltimore Row home: either no setback or a setback merely enough to accommodate the stairs (3-6 feet), 2 floors, 12-18 ft wide, small stoop with a finished floor elevation at ground level or a few steps above. The fenestration consists of the two second floor windows and the larger first floor window with the off-set door.

Elevation



Figure 31: Row home elevation view

Materials



Figure 32: Row Home Finishing Materials

Finishing materials range from brick, to aluminum siding to formstone, some of these materials have been painted over and awnings punctuate the streetscape. In many instances, the original marble steps remain.

Sketches in Figure 35 of the street sections are drawn to scale to clarify the experience of the streetscape in the neighborhood. Differences of street width change impact the building envelope’s relationship to the street, but in every

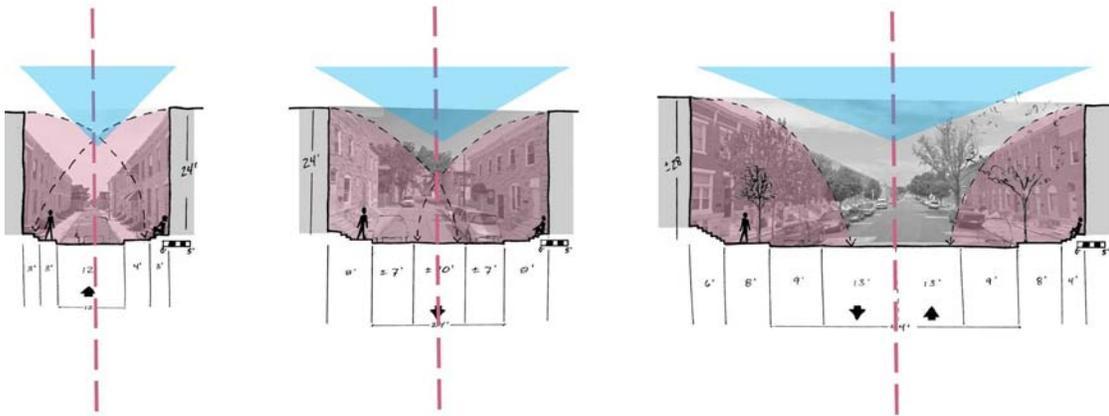


Figure 33: Street Section Profiles

instance, the mirroring sidewalks, entrances, and buildings provides a level of expectation; a newcomer quickly knows what is coming next. Street trees currently break the pattern of regularity, with some old, some young and many missing.

Vistas shift with the width of the streets as well—standing in the middle of streets of 26’ or less widths, the view is immediately constricted by the proximity of the row homes. On the wider streets, the vista is more expansive. Either way, the vista is constrained primarily to the sky from the vantage point of the street—narrow sky vistas or wide sky vistas.

McElderry Park’s gently rolling hills, create an almost horseshoe shaped bowl which tapers to the low point in front of library. The topography allows for

changes in view: the high points existing on wide streets provide vistas that connect the neighborhood to surrounding areas.

This topography leads to quick flow of stormwater throughout the neighborhood while also providing some vistas. While vistas on narrow streets are less expansive, the views from hill tops on wide sky streets serve to connect the neighborhood to the surrounding city. (Figure 37)

An inverse of the figure ground in Figure 36 emphasizes the space between buildings. The interior spaces of the blocks are uniquely dependent on the random

Figure Ground Inverse
■ intersitial spaces

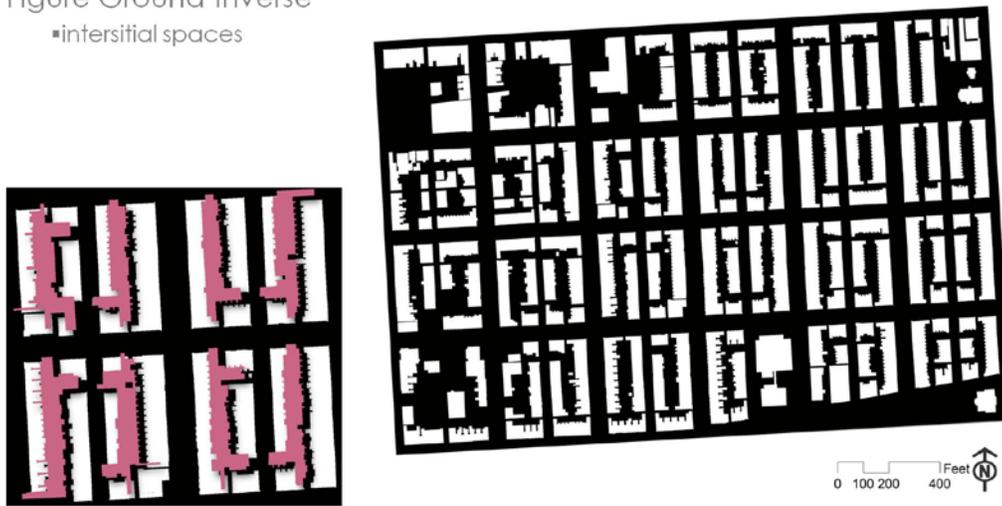


Figure 34: Figure Ground Inverse add ons and sheds in the yards extending to the alleys. Alleys and rear yards comprise roughly one third of the neighborhood. Alleys and the abutting back yards are perceived to be unsafe. Residents see them as corridors of crime, collectors of garbage, and the realm of rats. Anyone who enters or is seen in an alley is viewed



Figure 35: Views shaped by topography and buildings

with suspicion by the residents(Myers-Edwards, 2011)(Wirth, 2011). Because of these concerns, the alleys and abutting backyards are generally uninhabited. While some residents have walls and fences, they observed that these walls do not prevent theft, so residents do not keep anything of value in their backyards. Residents who have the means, put up fences around their back yards. Residents claim that the garbage in the alleys and vacant lots is dumped by outsiders. In the following section on community engagement, the designer will further discuss resident concerns regarding alleys.

The alleys range from 8-11 feet wide, and all serve to direct run-off away from the rear of the row homes and carry the run-off to the streets.

Paved Alleys

- Stormwater run-off
- Vehicle access



Figure 36: Paved Alleys

Many residents, seeking privacy or safety, have fenced their rear yard and cut off their direct relationship to the alley.

- Fencing
- keep out
 - **and** cut off



Figure 37: Fencing in alleys

The rear yards range from 10-20 ft in depth. The majority of rear yards are paved over with cement or asphalt. Run-off has no opportunity for infiltration. The

- Rear Yards
- Paved (primarily)
 - Stormwater run-off
 - Lack of vertical interest



Figure 38: Rear yards in relation to alleys

alleys in McElderry Park neighborhood provide an excellent opportunity for increasing green space available to residents. The designer met only one resident who had water in the basement during storms, but recent construction had resulted in the resident's rear yard sloping toward the home rather than away from the home. The surrounding rear yards sloped toward the alley and were not experiencing water intrusion. Many residents claim that paving rear yards cuts down on rat infestations, however, the designer has not been able to find data that would support this technique.

This alley (Figure 39) had been recently cleaned by the neighborhood association, yet it had already collected new garbage.

Dumping

- Lack of eyes on space
- Lack of city enforcement
- Outside perception



Figure 39: Alleys collect garbage

Finally, the utility wires generally run through the alleys. Utility poles and the spaghetti of overhead wires is part of the overhead view in every alley. Any

potential development or plantings would have to consider this experience.

Utilities

- Impede access in some alleys
- Impact visual experience
- Impact potential plantings



Figure 40: Utilities run through the alleys in most of McElderry Park

Finding the Park in McElderry Park

Within McElderry Park two community gardens, some vacant lots, the lawn and trees that front the library, and the playground and trees across from Tench Tilghman Elementary serve as the green space for the whole of the neighborhood. The total amount of green space is 2.1 acres. Given the paucity of green space, three interviewees mentioned that a common refrain in the neighborhood is, “Where is the park in McElderry Park?” None of the existing green spaces are larger than an acre.

Although one community garden has a labyrinth, repeated site visits and observation suggest that this space serves more as an event space and talking point for community leaders rather than a space that community members regularly use.

The designer made it a point to observe the space during each visit (over 40 visits) yet never saw anyone in the space.

Four parks are within a half mile of the border of McElderry Park. To the north, Clifton Park houses a high school, a recreation center and pool, golf course, Civic Works and a new community garden venture, including hoop houses. This is the park farthest from McElderry Park. To the northeast, Bocek Park primarily serves as fields for pee-wee football leagues. A small tot-lot is fenced off and a pavilion stands in disrepair. Elwood Park, two blocks to the east side of McElderry Park, is a smaller park and its seating and playground are in disrepair. Patterson Park, to the south is one of Baltimore's oldest parks. It contains an ice rink, two playgrounds, tennis courts, baseball fields, pond, and historic buildings including the Pagoda and headquarters for the Friends of Patterson Park. These four parks ring the neighborhood, but during interviews only three residents indicated visiting the parks. Community leaders (Smith and Edwards-Myers) confirm that the majority of community members do not visit the parks.

7

Community Engagement Process

Chapter 2 outlined the overall research and design process, including community engagement. This chapter explains the community engagement process. Several previous studios in the MLA program had introduced and utilized community workshop methods and modified charrettes as part of the design process for particular projects. Building on that preparation and using Patrick Condon's book, *Design Charettes for Sustainable Communities* as a guide, the designer adapted exercises and approaches for the workshops, working groups and meetings in McElderry Park. The designer also drew on William Whyte's work and Mark Francis's *Urban Open Spaces: Designing for User Needs*. Community engagement took four major forms:

- Interviews (Stakeholder and Resident)
- Community leader meetings
- Small neighborhood working groups
- Large community workshops

Information from the community served a vital role in the design process and impacted the design through editing of the master plan. A time-line diagram in

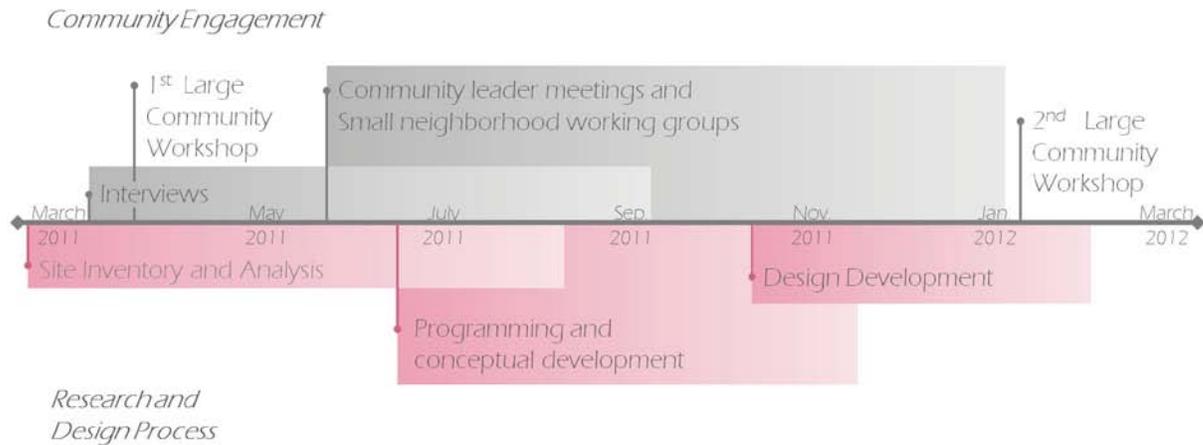


Figure 41: Timeline of Community Engagement and Design Process

Figure 43 shows the relationship between the community engagement process and the design process.

Before moving into a discussion of interviews and meetings, a note regarding the use of community engagement in McElderry Park is warranted. McElderry Park, like many predominantly African-American neighborhoods, suffers from negative past experiences of outsiders imposing development plans. In 2006, McElderry Park and the CARE neighborhood to the west created the previously mentioned Monument-McElderry-Fayette Area Plan. This document was a direct response to the East Baltimore Development Incorporation's development project that, in partnership with John Hopkin's University and Baltimore City, impacted the nearby neighborhoods by moving over four blocks of residents through the use of eminent domain, closing streets for construction, and

promising jobs that did not materialize (Edwards-Myers). The Monument McElderry Fayette Revitalization Plan outlines a commitment to keeping current neighbors in their homes and not permitting people to be moved by eminent domain (The Monument-McElderry-Fayette Community, 2006). Given this history, community members understandably respond to outsiders with skepticism. The designer recognized that anyone who wishes to act in good faith when working on anything resembling development plans for the neighborhood would need to seek out community input on the project.

Community involvement serves as a vital part of the design process, and hopefully implementation. The conducted interviews, workshops, and other interactions informed the design process and demonstrated how design provides an important opportunity for positive movement in individual's and community's lives.

Stakeholder Interviews

Interviews sought to get at different information depending on the interviewee. Certain stakeholders provided historical, political, and or ecological knowledge of the site that the designer might not have otherwise ascertained. Most interviews, however, were intended to cover particular topics: areas of concern regarding the neighborhood; what the interviewee enjoyed in the neighborhood, changes the interviewee would welcome; and whether the interviewee utilized the parks and other green spaces in the neighborhood and surrounding areas. The

interviews were free flowing, allowing the respondent to discuss issues of importance to them.

Major stakeholders included the president of the McElderry Park Neighborhood Association, and long-time resident, Ernest Smith, Elizabeth Meyers-Edwards of Banner Neighborhoods, Glenn Ross, longtime resident and community leader and activist, Robynn Lewis, of the adjacent Patterson Park Neighborhood Association, Drew Bennett, of the adjacent CARE Neighborhood Association, Ed Sabatino, Director of Historic East Baltimore Community Action Coalition, which works closely with Johns Hopkins University, Jill Jonnes, Director of the Baltimore Tree Trust, Dr. Ray Bahr, founder and director of the

10 Stakeholder Interviews



Figure 42: Organizations representative of stakeholders interviewed

Harris Creek Watershed Association, Duncan Stuart, of Baltimore City's Department of Public Works (no longer), Sadie Drescher and Lori Lilly of The Center for Watershed Protection. These stakeholders provided information specific

to their work as it relates to McElderry Park. Many had long-term working relationships and ongoing projects with the neighborhood. (Interview notes can be found in Appendix A.) Outcomes of stakeholder outcomes will be discussed in the following chapter.

Resident Interviews

Several residents agreed to be interviewed. Aliases are used for those residents who wished to assume anonymity. Resident interviews were intended to cover particular topics: areas of concern regarding the neighborhood; what the interviewee enjoyed in the neighborhood, changes the interviewee would welcome; and whether the interviewee utilized the parks and other green spaces in the neighborhood and surrounding areas. The format of semi-structured interviews allowed respondents to discuss issues of personal importance. Many of these

17 Resident Interviews



Figure 43: Resident Interviews

interviews happened while out in the neighborhood, so interviewees often pointed to examples in the surroundings to support their observations.

Community Leader Meetings

Four community leader meetings were coordinated through the Neighborhood Association and Banner Neighborhoods. These meetings granted the designer access to the president of the Neighborhood Association, block leaders, and community outreach personnel from Banner Neighborhoods, who play an important leadership role in the neighborhood. Two community leaders, Ernest Smith (President, McElderry Park Neighborhood Association) and Beth Meyers-Edwards (Banner Neighborhoods) led the designer on walking tours of the neighborhood pointing out areas of concern and potential. The participants at these meetings gave extensive suggestions and feedback throughout the design process.

4 Community Leader Meetings



Figure 44: Community Leader Meetings

Neighborhood Working Groups

The small neighborhood working groups served as the primary design idea generation. As constraints and opportunities were discussed in this forum, the participants proffered a variety of suggestions and considered all other suggestions with openness.

In the Neighborhood Working Group, the designer reviewed the basic site analysis and sought feedback regarding opportunities and constraints as well as suggestions for specific site interventions. Some Stakeholder and resident interviews continued, as did regular meetings with the President of the McElderry Park Neighborhood Association, Glenn Smith and Beth Myers-Edwards, an outreach coordinator for Banner Neighborhoods, a highly active organization in the community.

3 Small Neighborhood
Working Groups



Figure 45: Neighborhood Working Groups were more relaxed

Community Workshops

Two large community Workshops bookended the community engagement process. The Community Workshops were tailored to gather specific information. The first Community Workshop primarily sought a broad overview of the community's concerns, important locations, potential site locations, and

2 Large Community Workshops



Figure 46: Large Community Workshops
desires/needs. Community members joined in mapping exercises to identify opportunities and constraints in the neighborhood. They also identified specific needs and desires. At the second community workshop, community members gave feedback to the first draft of the stormwater master plan. Community members then focused on specific aspects in break out given a chance to focus on specific aspects in break out groups. The methods used in the workshops are discussed here. The outcomes are discussed in the following chapter.

First Community Workshop—Set-up and Experience

The first community workshop took place on Tuesday, May 23, 2011 at 6:00 pm. Located at the McElderry Park Neighborhood Association, outreach and advertising regarding the workshop took place through posting of flyers, community listserv, community newsletter, website calendar posting, and passing out of flyers at community activities. Approximately 30 people participated. The meeting opened with a brief discussion of green space as it pertains to cities and discussion by meeting participants about green space in the neighborhood. Some of the findings from this meeting include the lack of green space and how participants understood the term, “green space” to indicate grass and playgrounds.

The format of the meeting included mapping exercises that consisted of three stations with different goals for each of the maps. Station one consists of three maps, designed to elicit specific information: Map 1 asks community members to map issues and concerns. These are keyed by sticker color and include flooding, crime, dumping, rodents and other. Markers are available for residents to write in notes if they desire. Map 2 asks community members to map important places in the neighborhood. Map 3 asks community members to map community needs. In an effort to encourage thoughtfulness and to assure that the need is something the community member truly values, the question is posed in the following manner, “What would you put on your block to make the neighborhood better.”

Station two (one map) asks residents about potential locations for increasing green space. Residents are able to use as many stickers as necessary. Based on the introduction discussion, there has been some priming toward consideration of spaces other than the few vacant lots. (Precedents such as the Edmonston Green Street project were discussed.)

Station three (one map) seeks to determine what features (amenities) community members value in green space. Community members have 5 stickers and must choose among the features. Community members add two features to the list. The features were:

- Seating
- Water Features
- Lighting
- Sculpture
- Learning Opportunities
- Playgrounds
- Paths (not sidewalks along the road)
- Opportunities for Relaxation
- Habitat for Plants
- Habitat for Animals
- More Trees (Added by community members)
- Roller Coaster (Added by community members)

Attendees voted (placed stickers) according to the importance they placed on a given feature. For example, three stickers on seating and one sticker each on paths and lighting would show that the community member highly valued seating and that lighting and paths were more important than the other features listed.

Station three asks community members to consider locations for green space. The opening discussion presented varied types of green space, so this map is intended to

reveal how open the community members are to adding green space in what might be considered non-traditional ways or places.

Second Community Workshop—Set-up and Experience

The second community workshop took place on Wednesday, February 15, 2012 at 6:00 pm. This workshop aimed to elicit clear responses to the overall stormwater master plan draft and specific design interventions. Again the meeting occurred in the McElderry Park Neighborhood Association building and was advertised as was the first meeting. The workshop had approximately 20 attendees, 15 of whom did not attend the first community workshop.

The workshop opened with a 10 minute slide show and introduction of the stormwater master plan and the site specific interventions. Then the workshop members divided into four break-out groups and reviewed printed versions of the master plan and site interventions. Each break-out group took 25 minutes and focused on a specific item from the master plan: The Water Collective (proposed programming); Harris Creek Walking Park (proposed intervention); Port Street Plaza (proposed intervention); traffic and parking (proposed plan). The break-out groups reported their respective responses to the whole workshop. The workshop was then open for discussion of the stormwater master plan. Questions were asked and suggestions were given over for the duration of the remaining 15 minutes.

As mentioned earlier, meeting findings, results, and implications are discussed in the following chapter.



Community Engagement Outcomes

The outcomes of the community engagement process are outlined here. The outcomes are not always neat, easily identifiable pieces of information. In some cases, input from different sources conflicts (as in the case of seating). When shifting through the information gathered from the community engagement process, the designer necessarily made choices. Input from stakeholders differed slightly from that of residents as stakeholders focused more on funding and leadership issues. Only two of the 10 stakeholders interviewed lived in the neighborhood. Because the work of this thesis is intended for the benefit of the residents, the designer weighed resident responses more heavily. This chapter outlines the information the designer gathered from the community engagement process. In the following chapter, the designer will discuss how the community engagement outcomes had to be examined in light of the designer's site observations in order to determine appropriate design response.

Interview Outcomes

Stakeholder interview outcomes suggest the following:

Primary Concerns: Safety, health (dumping, rats, childhood asthma and obesity), educational opportunities (school aged children).

Secondary concerns: Funding, Job training, ability to get city support of projects.

Needs/desires: Capable leadership, collaboration among neighborhood groups, a master plan for neighborhood development, green space, and housing.

Stakeholders generally work or volunteer for organizations with missions specific to some area of service in McElderry Park or surrounding area. As a general rule, the stakeholders took a broad view of the neighborhood and were less concerned about the “what” and more concerned about the “how.” Funding considerations and city support form an important part of how stakeholders look at

Figure 47: Primary and secondary concerns



The residents interviewed tend to fall into two categories; those who feel that the City needs to come and take care of things and those who feel the residents should and will have to do it themselves. However the general outcomes of the interviews follow along similar lines to that of the stakeholders:

Primary Concerns: Unemployment, safety and health (dumping, rats, addiction, childhood obesity).

Secondary Issues: Too many liquor stores, difficulty between neighbors, young people lacking respect, young people not having anything to do, negligent neighbors, lack of access to fresh fruits and vegetables.

Needs/Desires: Jobs, job training, places for children to play, seating, eat-in restaurants, more home owners, less vacant homes.

Residents worry a great deal about safety and health issues in the neighborhood. Many linked childhood obesity to lack of outdoor play areas and the safety of the neighborhood. Residents also express frustration with those neighbors who are not living up to neighborhood expectations. One resident stated that the only changes they needed in the neighborhood were certain neighbors. Residents noted the lack of parks and “things to do” in the neighborhood. Only one resident stated a very clear vision for the neighborhood: “McElderry Park should be like the suburbs in the city.” When asked what that would look like, the resident paused, “With window boxes and street trees, maybe,” (Street, 2011).

The differences between stakeholders’ and residents’ interview outcomes are worth noting. Only some stakeholders mentioned jobs and unemployment specifically and this was usually after safety and health issues. Perhaps this is because for them, the need for jobs is a given. It could also be that several of the stakeholders did not live in McElderry Park, were not black, or were not from the same socio-economic class, and so perhaps their perception of the neighborhood

needs differed. Residents on the other hand, mentioned jobs almost immediately when asked about what the neighborhood needs. In fact, the designer was approached at least 4 times by passers-by in McElderry Park and asked if she had work for them.

Stakeholders responded negatively to any mention of adding seating to the neighborhood. No stakeholder suggested it and when asked by the designer, several stakeholders stated that their experience proved seating to be an attraction to the indigent and “undesirables”: the very things the neighborhood was fighting against. The residents, many of whom walk throughout the neighborhood or use public transportation, have a different perspective on how they would use seating if it

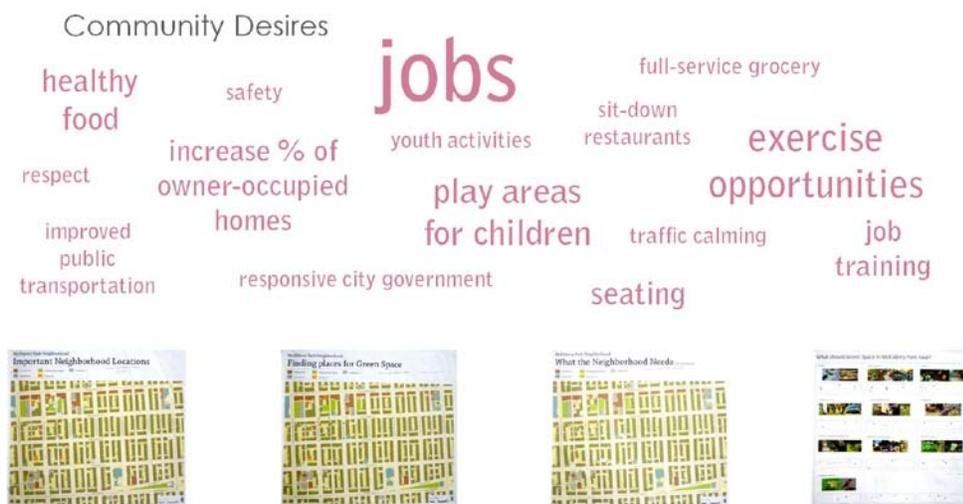


Figure 48: Word Map of Community Desires

were available. Some residents talked specifically about benches at bus stops, but most signified that seating would be welcome along the streets or in the vacant lots.

First Large Community Workshop Outcomes

Community members took the mapping quite seriously and some spend a great deal of time on one or two of the maps. The majority of the meeting participants visited all the stations, but do not mark all the maps. Two community members vocally signify that they do not wish to participate; however, both still navigate the stations with the help of the people who are managing the stations. The people assisting at the stations are able to mark the maps on behalf of the reticent community members. In some cases, the community members discussed sticker placement together while one person placed a sticker.

Station One, Map 1: Issues of Concern This map allowed community members to map

- Rats—20 locations (5 locations mapped outside boundaries)
- Crime—8 locations
- Dumping—18 locations (4 locations outside of boundaries)
- Flooding—none marked

Given individual conversations with community members, the author anticipated that crime would be the primary issue on this map. However it cleanliness is the dominant concern of the neighbors who attended and participated. Of important note is the relationship between the locations marked as crime areas. Three of the eight locations marked are liquor stores.

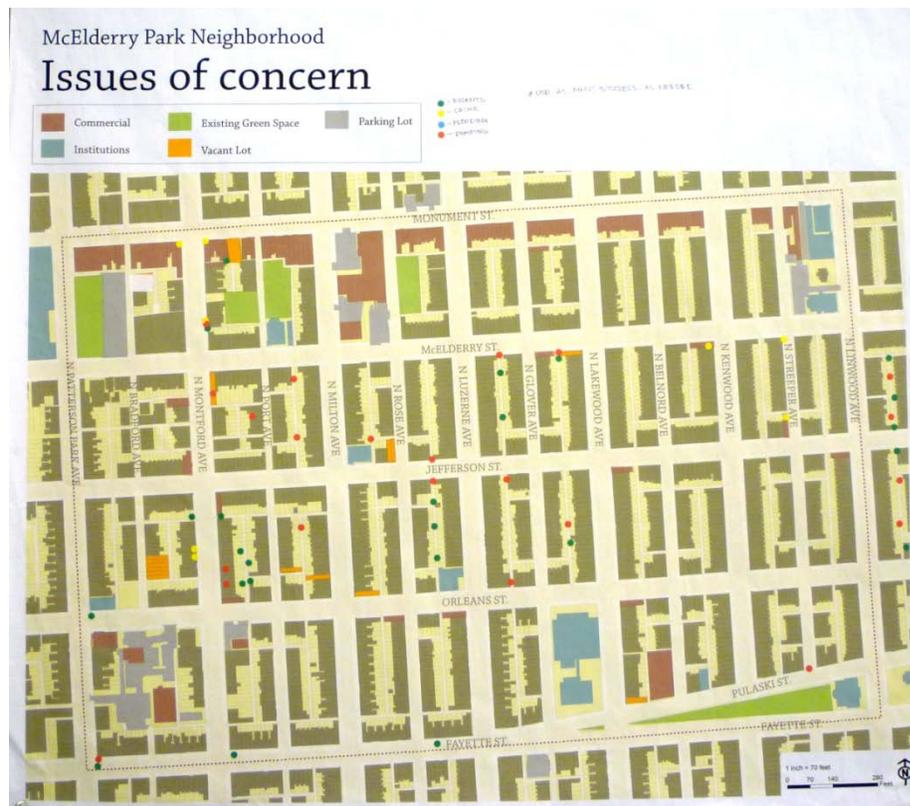


Figure 49: Community Mapping Exercise: Issues of Concern

Station One, Map 2: Important Neighborhood Locations

Community members either found this map difficult or uninteresting. It received less attention and fewer mark ups than other maps. Also it seemed that one community member misunderstood the directions and marked this map with items for Map 3. Those mark ups are reflected in the discussion of that map.

One failure of the Map 2 exercise was that it did not capture how many community members found a given location important; if a location was already marked a community member had no reason to mark it a second time.

The locations marked as important to the neighborhood:

- Tench Tilghman Elementary and playground
- William S. Paca Elementary School

- Patterson Park Branch of the Enoch Pratt Free Library
- Liberty Learning Center
- Rose Street Garden
- Port Street Gardens
- McElderry Park Neighborhood Association and Resource Center
- Large Daycare on Linwood
- Convenience Store (Linwood and Jefferson)
- Amazing Grace Lutheran Church



Figure 50: Community Mapping Exercise: Important Locations

All of these would be expected as important locations. The surprise is what is not on the list; no one marked Monument Street or any of the businesses on Monument Street. Nor were any of the businesses on Fayette Street marked. It is also important to note that only one church is marked. One community leader, (Beth Meyers-Edwards) suggested that since many churches have congregations

that live in other neighborhoods those churches are not as integrated in the neighborhood.

Station One, Map 3: What the neighborhood needs (on your block)

This map permitted community members to think about what their neighborhood needs to become a great neighborhood. It also encouraged neighbors to choose only those things that they would be willing to have on their block. Some community members seemed to have difficulty coming up with what they felt the



Figure 51: Community Mapping Exercise: What the Neighborhood Needs

neighborhood needed. This could be due to the fact that their focus up to this point in time has been on dealing with ridding the neighborhood of problems. Or, it could be because they are content with the neighborhood as it is except for the problems. It is also possible that community members did have particular items they want to

see in the neighborhood (more ex-offender job resources was mentioned in the meeting but not put on the map), but they would not be willing to have that on their block. What did make it onto the map:

- Trees (listed in several locations)
- Parks (two locations)
- Parking lot (one location)

Station Two: Finding Places for Green Space Here, participants could use as many stickers as they wished to mark location they deemed appropriate to put green space. All the vacant lots (orange) were marked. A church lot off of Linwood Ave. was marked, as was a lot belonging to a church on the corner of Patterson Park Ave. and Orleans St. Several stickers marked Milton, Montford, and



Figure 52: Community Mapping: Finding Places for Green Space

Port Avenues. The residents who marked these areas noted that they felt these streets lent themselves to becoming what the Department of Transportation had presented to the community as “complete streets” or streets where trees and storm water management is incorporated into the design. Again, what is not marked is important to note. No one marked any of the parking lots, including parking lots that consistently sit empty. And only one alley is marked. This is consistent with the understanding gleaned from observation and interviews that parking is sacrosanct and alleys are no go zones.

Station Three: What should green space in McElderry Park have? In this exercise, the community members used a limited number of stickers (they each had 5) to indicate which features were important. They could put one or more stickers on a feature relating to the importance given to the feature. One community member wrote in their votes. The votes are as follow:

- Seating--7
- Water Features--6
- Lighting--4
- Sculpture--3
- Learning Opportunities--3
- Playgrounds--2
- Paths (not sidewalks along the road)--6
- Opportunities for Relaxation--3
- Habitat for Plants--5
- Habitat for Animals--3
- More Trees (Added by community members)--3
- Roller Coaster (Added by community members)--6

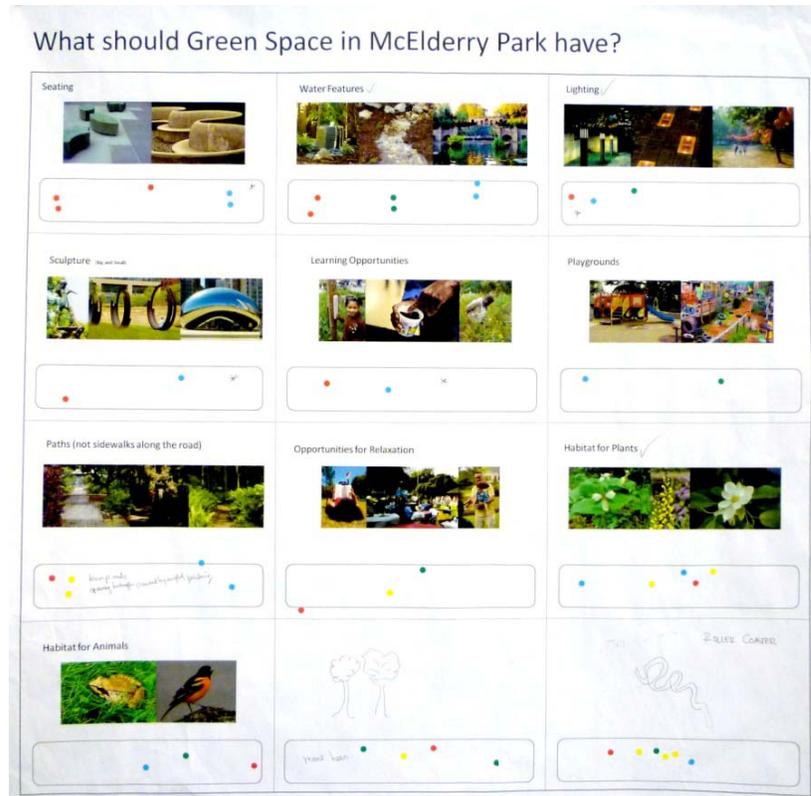


Figure 5: Community Mapping: Amenities

In some regard, the votes are surprising. Playgrounds, education, and recreation receive attention in interviews, but here the votes go to more concrete items. Of course, these are not mutually exclusive. Of note, are the votes for the roller coaster suggested by a community member. While several community members voiced objections to a roller coaster per se, it is clear that the residents want unique, identity creating, and economy generating features in their neighborhood. Having something fun and entertaining for the neighbors would be icing on the cake.

Community Leader Meetings and Neighborhood Working Group Outcomes

As was mentioned in the last chapter, the Neighborhood Working Groups were creative thinking opportunities with a great deal of idea generation. This group produced a variety of design and programming responses including: stormwater fed tree pits, individualized rear yard design plans, shared green space in alleys, shared green roofs (along the row homes), increasing neighborhood

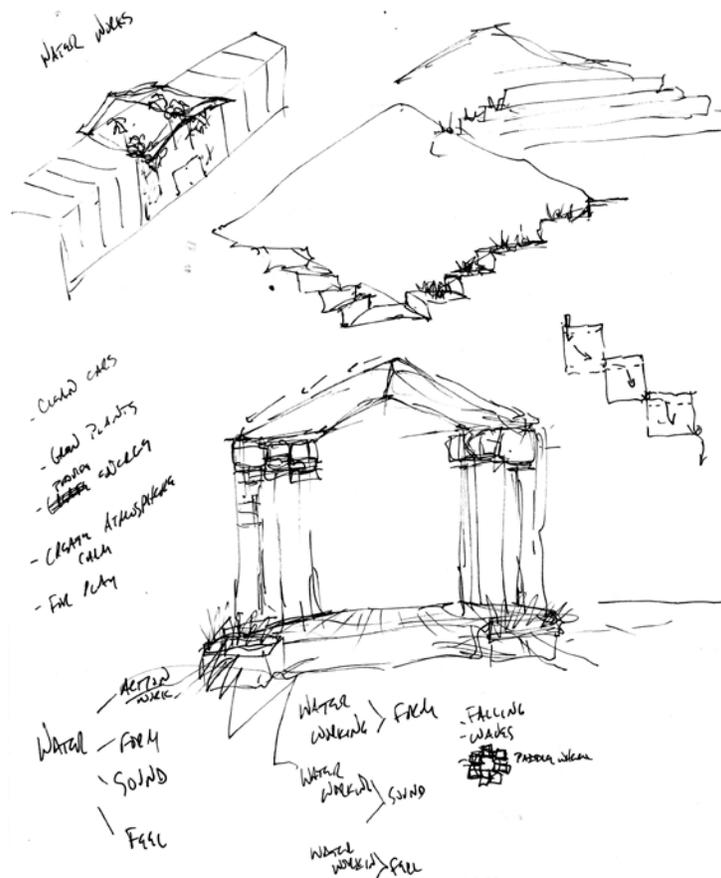


Figure 54: Sketch of idea from Neighborhood Working Group--Turning Empty Rowhome into Green House Arcade or Stormwater Car Wash

identity with design features, educational opportunities for elementary students using stormwater features, decreasing street size, creating bike or pedestrian paths, and more.

While not all of these were incorporated in the McElderry Park Stormwater and Green Space Master Plan, the group help assessed the pros and cons of those items the designer did include in the plan.

One important outcome from the Community Leader Meetings built on the first Community Workshop in identifying potential site locations for design interventions. Attendees at the Community Leader Meetings were open to the variety of locations identified for green space by the residents; however they were aware of the political likelihood of certain sites. They also encouraged “aiming high,” specifically as it regarded the Harris Creek Walking Park site. Rather than opting for a less grand design, the meeting attendees insisted that McElderry Park Stormwater Master Plan present a bold idea.

9

Engagement Outcomes and Site Analysis

This chapter explores the connections between the community's expressed concerns and desires and the existing site in order to fully understand how the community engagement outcomes informed the design process and the actual design. Special attention is given to human behavior in this the chapter, as the community's concerns and desires are impacted by what residents and visitors to the neighborhood do.

Resident Responses to Row homes

One of the primary concerns expressed throughout the community engagement process regards the vacant lots and vacant row homes. Aside from the crime and safety issues these vacancies present, the recognition of how these vacancies break the pattern of the row home system, the built fabric of the neighborhood can help explain the strong reaction neighbors have to vacant sites.

As it exists in McElderry Park, the row home system creates mirrored patterns in building forms and the block/grid system. As discussed in the Existing Morphology Chapter, symmetry is an integral part of the system. It is because of this symmetry that any disruption in the row home fabric—including vacant lots, boarded up homes, roofs under disrepair—appears to indicate signs of neglect.

Negative attention is drawn to these areas of neglect, with many residents observing the lack of any other redeeming qualities of these particular sites. Rather, these gaps in the row home system feel like a violation. Community leaders and residents have been vocal in their call for keeping the row home system intact. In short, vacant and decrepit row homes should be rehabbed and re-inhabited. Demolition is the last resort. (Street, 2011)(Myers-Edwards, 2011).

What about the gaps in the system? Some gaps in the row home pattern are planned such as the alley entrances and exits.



Figure 55: Street of rowhomes: vacants stand out. The alley is planned interstitial space.

On the back side of the houses are the alleys, yards, additions, porches, and occasional shed that create disparate spaces within the broader pattern. As was discussed earlier, the rear yards and alleys are largely neglected; both activity and attention to the home are focused on the front of the home.

Residents showed the designer a row of homes that they felt represented the best of the neighborhood. Ideally, all row homes would look as a small set does on the east end of Jefferson St. (See Figure 52)

On the same street, Jefferson Street, but three blocks west, residents point to a block that provides the opposite example; everything that neighbors do not want in the neighborhood: vacant homes, boarded-up corner business, weeds growing from sidewalk, etc.



Figure 56: McElderry Park rowhomes which residents wish to emulate



Figure 57: Resident use this block as example of problem block

Residents and Access to Services

Residents mentioned the lack of full service grocery stores in the neighborhood, the lack of afterschool opportunities for youth in the neighborhood, the lack of sit-down restaurants, and the lack of parks, and access to jobs. A significant presence on the major thoroughfares (Monument Street and Fayette Street) is pedestrians waiting for buses. Throughout the neighborhood pedestrians hurrying to catch a bus, and pedestrians in general make up the majority of street traffic. Walking and public transportation are the primary forms of transportation for the residents (The Monument-McElderry-Fayette Community, 2006, p. 33).

A brief map study of the availability of some basic services within a quarter mile, half mile and mile of from the center of McElderry Park relates to resident concerns.

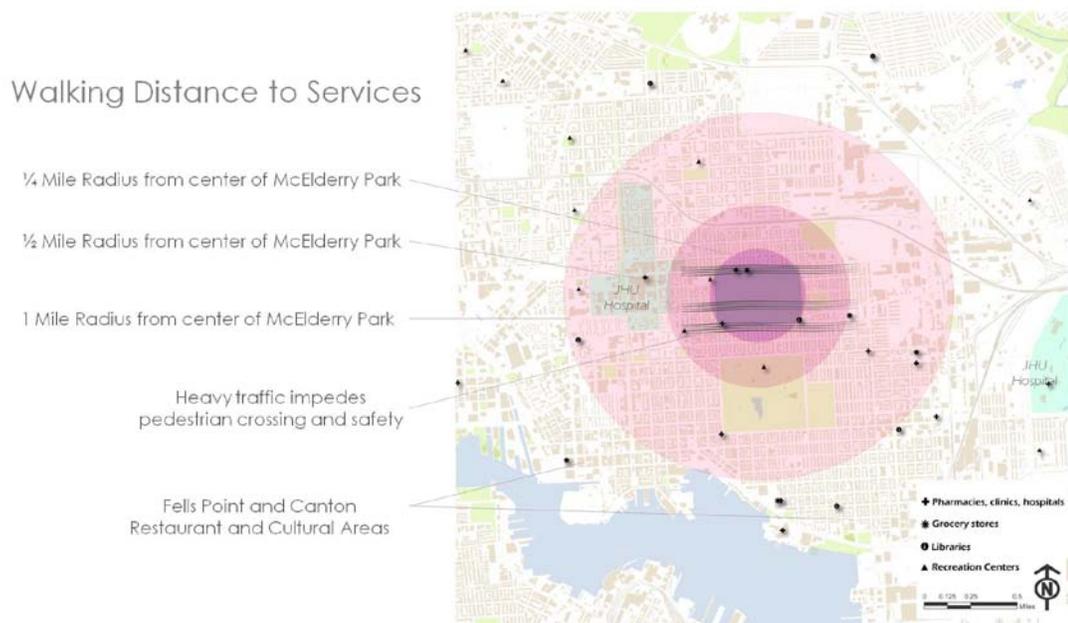


Figure 58: Residents and walking distances to services

While the quarter mile radius circle encircles the whole of the neighborhood, which suggests that walking within the neighborhood can be encouraged. However, the major parks are not reached until the half-mile radius circle, and the full service grocery stores, the hospital, major employers, and the waterfront are within the mile radius circle. Studies show that walkability is influenced by more than distance; however the quarter mile radius is useful in exploring the accessibility of services within a potentially walkable distance (Saelens, Sallis, & Frank, 2003, p. 81). Roads with high volumes of traffic also act as barriers, especially to the south.

Site observations for traffic volume and circulation on site identify several issues that are obvious to residents. Particular streets and intersections prove difficult for pedestrians to cross. Traffic volume increases during the commuting hours. Noise and smell from the busiest streets infiltrates the surrounding blocks to some extent and impacts those residents who live nearby. McElderry Park, as a function of historical accident, sits near important transportation corridors in Baltimore.

The CSX rail line runs three blocks north of the neighborhood, the Edison Highway runs north/south a few blocks to the east. The highest volumes of traffic are found on Monument Street, Orleans Street, and Fayette Street (Rt. 40) which all conduct traffic east and west to and from downtown Baltimore, to I-695 and I-95. Each of the mentioned roads consists of 2-4 lanes of traffic. Orleans Street, with two lanes in each direction, has no parking and therefore no buffer between the sidewalk and the road. All can be imposing for pedestrians to cross; particularly the

elderly, or people with small children. To the walking population, these roads act as effective barriers, and could keep McElderry Park residents neighborhood bound.

Currently, 5 bus routes serve the McElderry Park area. There is no plan for expansion of service and the planned Red Line will not impact the neighborhood. Most residents must use multiple buses to get anywhere other than downtown. While this may not seem like a significant deterrent to travel, consider the nearby amenities of Patterson Park, Canton and Fells Point to the south of the neighborhood. Several residents interviewed indicated that they and their neighbors do not participate in the many activities and festivals that take place in Patterson Park. They do not enjoy the restaurants in Fells Point or Highland or Canton. They do not walk along the waterfront promenade. While these locations are all within a mile or mile and half from the neighborhood, many McElderry Park residents are not using them.

Human Use and Behavior in McElderry Park

Because certain community concerns and desires implied much negative use of neighborhood space, site observations of human use, traces, and behavior were warranted. The designer visited the neighborhood over 40 times. Some visits were specific to site observation and included a variety of techniques mapping, taking photos, sketching and diagramming, taking measurements, counting behaviors or people. Other visits included interviews, meetings or related neighborhood affairs which allowed me to meet residents and get to know the neighborhood. Ten of those visits, the designer walked the neighborhood for a six hour stretch of time.

McElderry Park residents do engage in a great deal of activity on their stoops, sidewalks and streets. Visiting, playing, eating, home decoration, and relaxation are regular activities within the building envelope. The stoop is considered part of the home and sitting uninvited on someone else's stoop is unwelcome and sometimes discouraged (Voos & Fuqua, 2008).

The high frequency of littering is understandable. Due to the amount of everyday life that takes place on the streets and the lack of trash cans on the corners, perhaps it is not so surprising that trash is a significant neighborhood problem. A quick survey of trash suggested that the majority is food related. Eating while walking is implicated in the trash problem in the neighborhood. Improved



Figure 59: Human Traces

access to trash cans could prove to have an impact.

A wide range of economic activity takes place throughout the neighborhood. Several neighbors would like to see a wider variety of offerings on Monument Ave., however, the mom and pop and street vendors are meeting a neighborhood need.



Figure 60: Human use: economic enterprise

Community Concerns and Desires: A Matrix for Responding

After reviewing the site in view of the information gained from the community engagement outcomes, the designer revisited community concerns and desires. In some instances, the relationship between a concern and desire is straightforward. In others the relationship is less clear. Many potential design responses exist. In some cases, the designer opted to choose a community programming response related to the design interventions: the idea being that if the design response is robust and flexible, then it will serve as an infrastructure that community programming can be built upon.

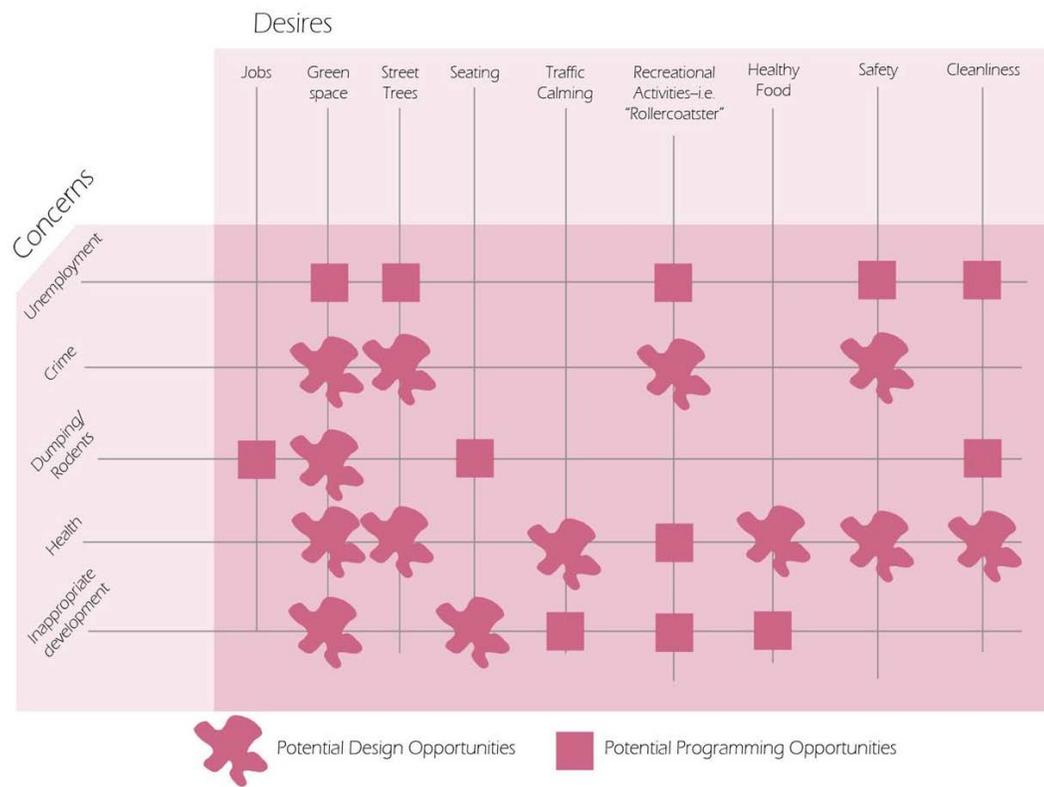


Figure 61: Community Design Opportunities Matrix

10

Site Interventions and Neighborhood Programming

The primary goal of this design thesis is to use an ecological urbanism framework in developing a storm water management design for a highly urbanized neighborhood that responds to community members needs. Community engagement identified community needs and desires which the

From Feedback to Form

- 4 sites identified for specific design intervention
- Development of neighborhood-wide programming
 - Alleys
 - Maintenance of sites
 - Employment

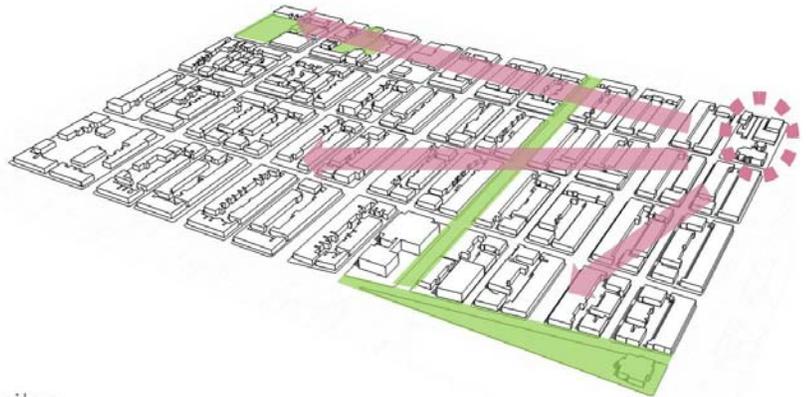


Figure 62: Site Intervention Locations and Programming

designer translates into design and programming opportunities. Under the design opportunities category the designer addresses the following community desires with specific design objectives:

Community Desires

Design Objectives

| | |
|-------------------------|---|
| Jobs | Educate, Employment |
| Green Space | Recreate, Infiltrate |
| Trees | Recreate, Infiltrate, Educate, Employment |
| Seating | Activate, Recreate |
| Traffic Calming | Activate, Educate |
| Recreational Activities | Activate, Recreate, Employment |
| Healthy Food | Infiltrate, Educate, Recreate |
| Safety | Activate, Educate, Employment |
| Cleanliness | Activate, Educate, Employment |

A closer look at the design objectives is merited. What does it mean to Activate, Educate or Recreate? As these objectives have grown out of the community engagement and site analysis outcomes, it may seem obvious what needed but the specifics of the objectives, including stormwater specific objectives

■ Activate

- Eyes on space
- Increase use
- Mixed uses and users
- Destination points

■ Recreate

- Increase green space
- Playground access
- Seating
- Exercise access

■ Educate

- Curriculum development with Living Classrooms
- Job training
- Community outreach

■ Employment

- Micro-business Plan
- Water Collective
- Maintenance Crew and Training Staff

■ Infiltrate

- Capture runoff
- Increase pervious surface
- Use pervious materials

■ Harvest

- Implement rain barrel cistern collection system

are included below.

These design objectives can be achieved in a variety of ways. The designer chose specific design strategies that grew from the theoretical framework discussed in Chapter two. While responding to community input, this thesis applies ecological urbanist strategies put forth by Branzi and Corner to the McElderry Park site. Doing so creates specific strategies that work together toward the larger goal. These strategies are as follows:

- To make use of existing infrastructure where appropriate. For example, connecting to existing storm drains for overflow of new systems; keeping the grid pattern formed by streets and row homes, but allowing different uses of street space, etc. (Branzi's Urban Refunctionalism)
- To apply the notion of transformation through flexible and non-imposing structures to event programming and organizational programming. Programming beyond the physical design element itself is an essential aspect of this master plan as it provides a simple and complementary means for community members to participate in and access the benefits of their neighborhood's ecology; the master plan will provide the organizational infrastructure for the community to access the benefits of using stormwater as a resource in a fair, consistent, but flexible manner (Branzi's Great Transformations through Microstructures)
- To connect to the broader community--reaching out and bringing in (Branzi's Cosmic Hospitality)

- To respect and draw upon the dynamism of natural processes and their relationships with urban morphology (per Corner)

The specific design responses that grow out of these strategies as they relate to the McElderry Park site are explored in the next chapter. First, locations for design interventions deserve attention. Each site choice takes into account a variety of issues. In conjunction with the locating each proposed site on the Site Intervention map, a discussion of those issues as well as some of the pre-development conceptual drawings follows.

Site Interventions: Locations

Locations chosen for design intervention were determined by a variety of factors including, intended function, community input, site suitability, and proximity to potential site stakeholders and caretakers. Programming interventions are not discussed here as they will be incorporated on a neighborhood-wide level (even if certain locations are suggested). Here the specific locations for design intervention are discussed.



Figure 63: Locations for design interventions

Site one is a 1.1 acre plot located on the 200 Block of N. Patterson Park Avenue across from the Tench-Tilghman Elementary School. This site had already been identified by the school and neighborhood as a site in need of attention. Some efforts had been made to consider what could be done on the site prior to the designer’s work with the neighborhood; however, the community was open to new ideas. The Center For Watershed Protection identified this site as a potential infiltration site. (Center for Watershed Protection, 2012)

The designer noted the ponding on the impervious surfaces as well. The site is large enough to accommodate multiple activities. It is proximate to both the



Figure 64: Most playground surfaces are impervious



Figure 65: One-third of area is parking

elementary school and the American Legion Post, so it has two institutional stakeholders who can potentially participate in park programming and care. Currently the school uses part of the park for parking. There is only one bench for seating.

Site two is a half acre site located on the corner of Monument Street and Port Street. It consists of a variety of parcels within the inner blocks currently used by the McElderry Park Neighborhood Association in conjunction with the



Figure 66: West Side of Port St.—Green space behind Neighborhood Association



Figure 67: East Side of Port St. Labyrinth by Amazing Grace Church

Baltimore Land Trust (Figure 67) The site also includes the vacant lots on Monument Street, and requires the demolition of three currently vacant row homes (commercial use) on Monument. The proposed site builds on an existing green space; the Amazing Grace Church on the south-east side of Port Street has a community garden area and a labyrinth with surrounding plantings (Figure 68). On this block, Port Street has been block to vehicle traffic, making it a pedestrian only walk. However, the area is not immediately visible from either the Monument Street entrance or the McElderry Street entrance. Also, the existing space lacks a strong identity (sense of place), clarity of use, and residents and stakeholders suggested that the space could become more integrated into the neighborhood.

Site three consists of all four blocks of Lakewood Avenue, the street only,



Figure 68: Lakewood Avenue Rowhomes



Figure 69: Street profile of Lakewood Avenue

from curb to curb, in McElderry Park. This site is chosen due to the topography of the neighborhood; much of the stormwater of the neighborhood is headed to this street. Historically, the path of the Harris Creek ran where Lakewood Avenue now sits. The existing street is 44 feet wide, with two way traffic and parallel parking on each side for the two northern most blocks. The two southern most blocks have angled parking on one side with parallel parking on the other. The site would

permit the east-west streets to continue through with raised intersections, creating 1.2 acres of new park area.

Site four also involves an existing street; Pulaski Street from Fayette Street to Linwood Avenue will be depaved and included as part of the already existing green space in front of the Patterson Park Branch of the Enoch Pratt Free Library. This site is 1.8 acres. Along with the library, the William Paca Elementary School is another institutional presence. Currently the green space serves primarily as a pass through space. There are no seating or activity areas, except the one bench for the bus stop. The Japanese zelkova trees are all full size and provide a unique tree canopy experience in the neighborhood. They are planted in a rather formal formation across a lawn which lines a walkway marking a sightline from the library center line (and entrance) to the Spanish War Memorial Statue.



Figure 70: View toward the Spanish War Memorial Statue

All four sites have proposed form design intervention, have proximity to institutions that can serve as site caretakers/promoters and help keep eyes on the

site. Unsurprisingly, they also share the characteristic of having existing impervious surfaces that will need removal. Finally, all the sites are framed by the row homes. In the case of the Lakewood Avenue and the Library Sq. sites, the relationship to McElderry Park's row homes is immediate; the row homes will be fronting on the proposed new green spaces. In the case, of the two other sites, the relationship with the site is more subtle; the site faces the rear of the row homes or is separated by a street. While this relationship cannot be ignored, it is the people in those homes and how they will use the proposed sites that matters most. The next chapter outlines the proposed site designs and neighborhood programming.

11

Design Response

As mentioned earlier the McElderry Park Stormwater Master Plan consists of both specific design elements as well as long-term programming for the neighborhood. Programming and design elements work as supports for each other; multi-functional spaces permit layers of use and experience in the neighborhood, activating areas in new and meaningful ways. The long-term programming is referred to collectively as the McElderry Park Water Collective. The design elements respond to specific community needs and input while reaching for the ecological urbanist goals mentioned in previous chapters. The major design and programming elements are diagrammed first and then the master plan is explored in more detail.

Green Space, Water Harvesting Blocks, Courtyard Alley Blocks

Figure 73 shows the major green space and park interventions (discussed in Chapter 9, Figure 65) as well as those blocks that will act as Water Harvesting Blocks and those that are best suited for becoming Courtyard Alley Blocks. The plan adds an additional 5.3 acres of green space to McElderry Park for a total of 7.4 acres of green space. Almost all new green space includes areas that serve as bioretention or infiltration for storm water. The plan does not currently take into account the potential green space that will be created as the Courtyard Alley

Blocks implement Baltimore City's existing green alleys plan. Some of those blocks will choose to de-pave their alleys, but others may not.



Figure 71: Harvesting Alley and Courtyard Alleys

Water Flow and Bioretention Areas

Figure 74 reveals that the overall topography of the neighborhood remains intact, respecting the existing water flow. The master plan slows the water at key locations and allows for infiltration to occur. These sites are designed for the 10 year 24 hour

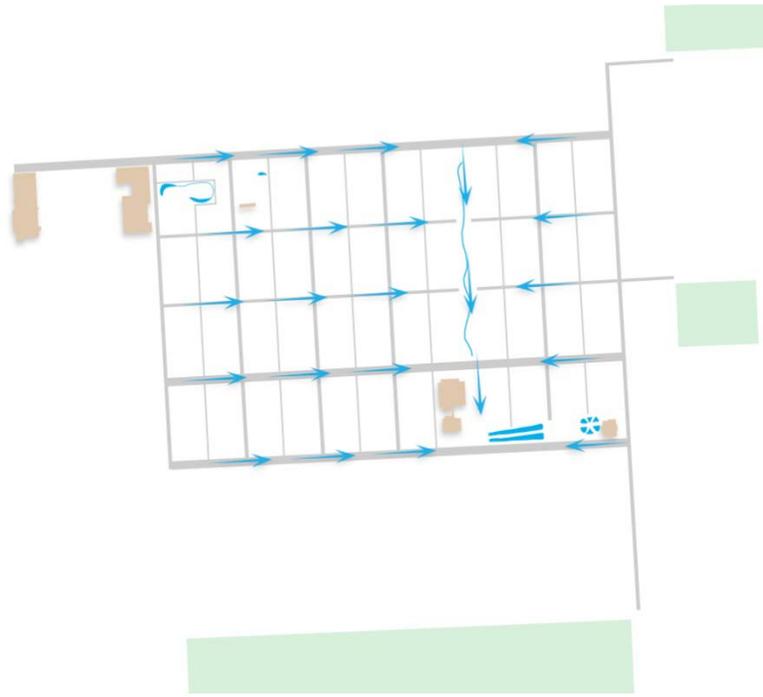


Figure 72: Water Flow and Bioretention

storm event and serve as site amenities when not infiltrating water.

Parking

Figure 73 addresses the need for parking in the neighborhood. Certain blocks will be encouraged to move to rear yard parking. Other blocks will use on street parking. This is both for traffic flow and overall neighborhood design reasons. Certain streets will be shifting from one to two way traffic will no longer be able to accommodate parking. Courtyard Alley blocks require on street parking. Also, the design of certain blocks makes them more suitable to rear yard parking than others.

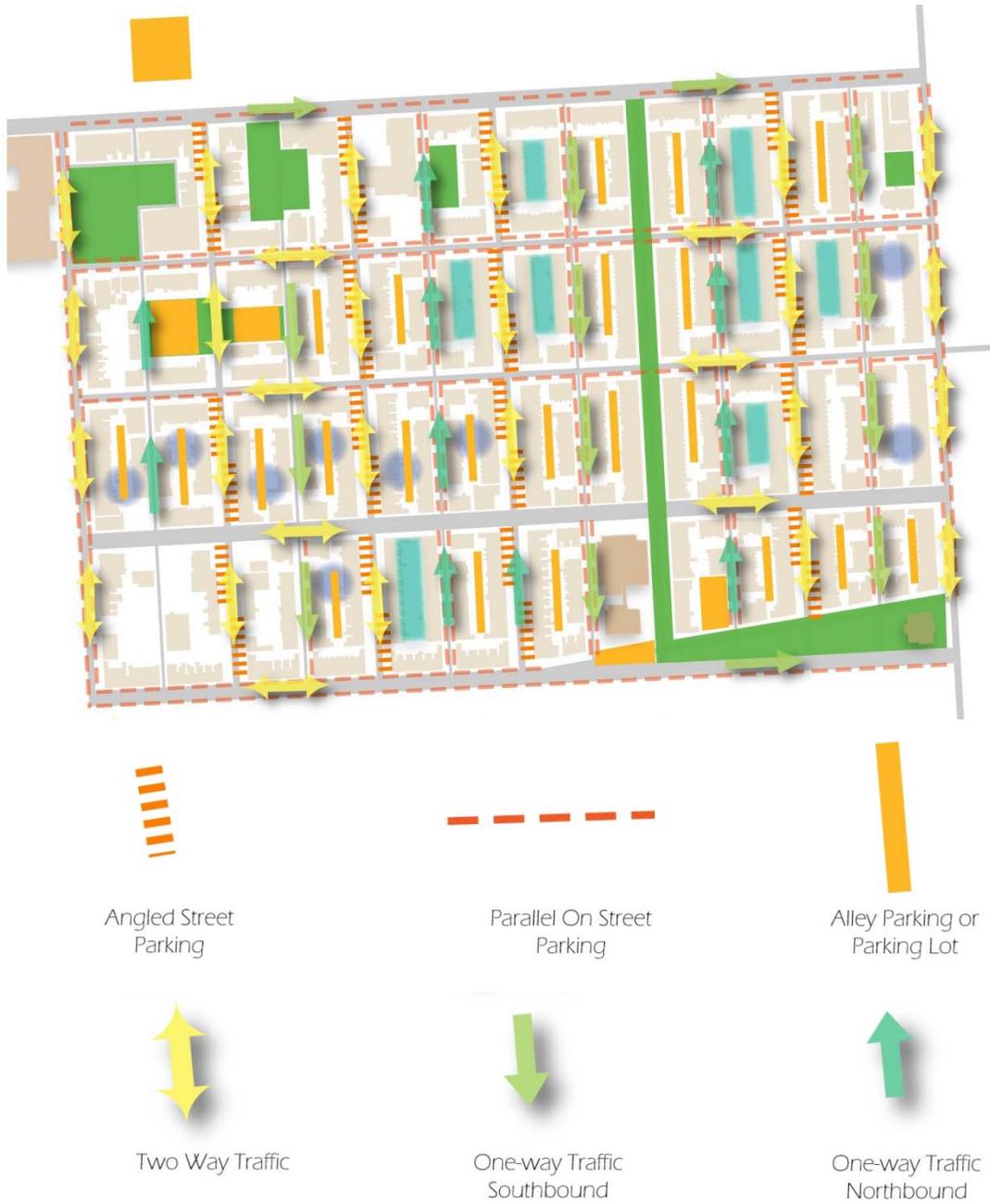


Figure 73: Proposed parking and traffic flow

Finally, given the ongoing need for alley clean-up, having residents more engaged

with their alleys and having more eyes on the alleys is another motivation for this design element. An existing parking and traffic flow diagram is included for comparison.



Figure 74: Existing parking and traffic flow diagram

McElderry Park Water Collective

Figure 77 diagrams the proposed locations for important programming elements of the McElderry Park Water Collective. The Water Collective campus will serve as an office for outreach and resource administration, and meeting place for the members of the Collective. The Campus will also serve as an educational resource, but two sites are specifically designed for educational outreach: Rain Watch Park and Library Square Park. Both sites are proximate to schools and it is

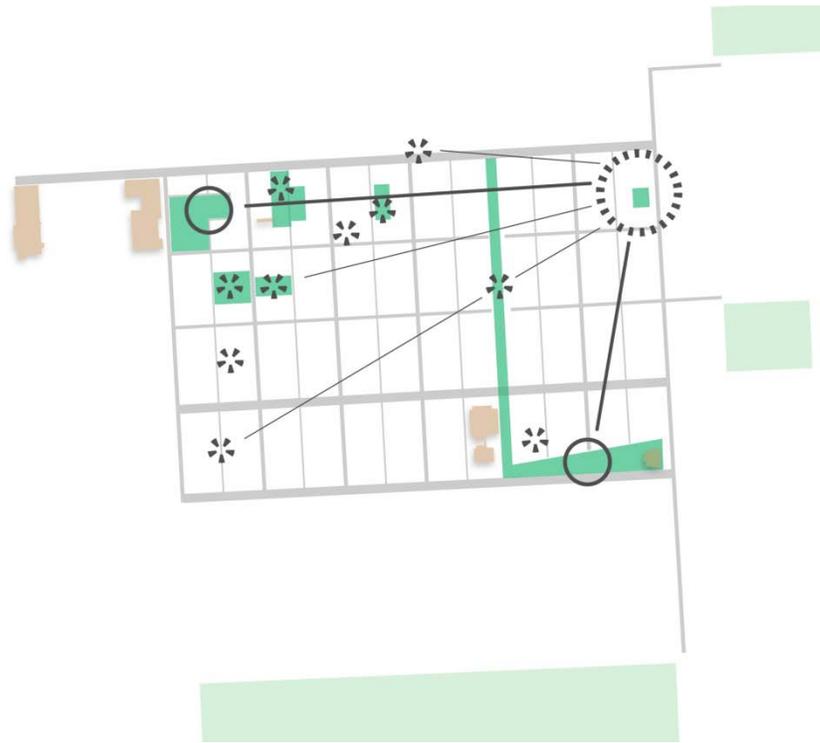


Figure 75: Water Collective Sites

recommended that the schools utilize or develop a curriculum relating to hydrology, habitat, climatology, etc. of the rain gardens. The Living Classrooms Organization (Baltimore), in conjunction with the National Aquarium and Science Museum are poised to support such efforts.

Economic Opportunities

Figure 76 locates potential micro business opportunities within the neighborhood and the existing commercial areas that the community wishes to strengthen. The community has a particular request for a grocery store (Harris Teeter or Trader Joes). Community leaders have identified a property and would like to move forward on courting such a store, feeling it could be the anchor for much change in the neighborhood.



Figure 76: Economic Opportunities

Leadership and Linking Beyond the Neighborhood

While some community leaders insist that changes can be made only on a block by block basis, it is important to look at the potential community anchors that exist within the neighborhood as it stands. Dividing the neighborhood into quadrants (see Figure 77) is common among current community organizers (Myers-Edwards and Jonnes). Not only does such division make spatial sense, but in each quadrant there are churches, schools or other public institutions that can serve leadership roles in the development process. The diagram also clarifies the important linkages to green spaces beyond McElderry Park. Linking the neighborhood to these green spaces will be accomplished via pedestrian and bike routes.



Figure 77: Links Beyond Neighborhood and Quadrants



The McElderry Park Stormwater Master Plan

The McElderry Park Stormwater Master Plan consists of both neighborhood programmatic elements, referred to as the Water Collective, and site design interventions, each with their own name. These responses are a direct outgrowth of community engagement and working with residents to come up with creative ways in which stormwater could serve as a resource rather than a liability. The neighborhood programmatic elements of the McElderry Park Water Collective are delineated on the Master Plan (Figure 81). The McElderry Park Water Collective, which is the umbrella organization for all the programmatic elements of the master plan, will be discussed first.

McElderry Park Water Collective

Because the idea for the Water Collective grew out of specific resident desires (e.g., jobs, job training, etc.) and how those desires could be met using stormwater, the Water Collective is intended to be open-ended in its development. The programming element listed here are not to be mistaken for a list of complete solutions for this or any other neighborhood. Rather, the intention is that the Water Collective, being co-operative in nature, will build on resident input and ingenuity and use the communal testing of ideas to find what works best for McElderry Park.

The co-operative model was chosen because several residents interviewed felt it was important for all community members to “buy in”: and “get back”. This ‘buy in’ and ‘get back’ could take many forms from monetary to volunteer time to other goods or services. In most cooperative models, communities vote on by-laws of the coop in advance, including a system for how to change the bylaws, etc. [cite] But the premise of the Water Collective is simple: part of each resident’s ‘buy in’ will be their stormwater and part of each resident’s ‘get back’ will be specific services that the Water Collective can render to the neighborhood.

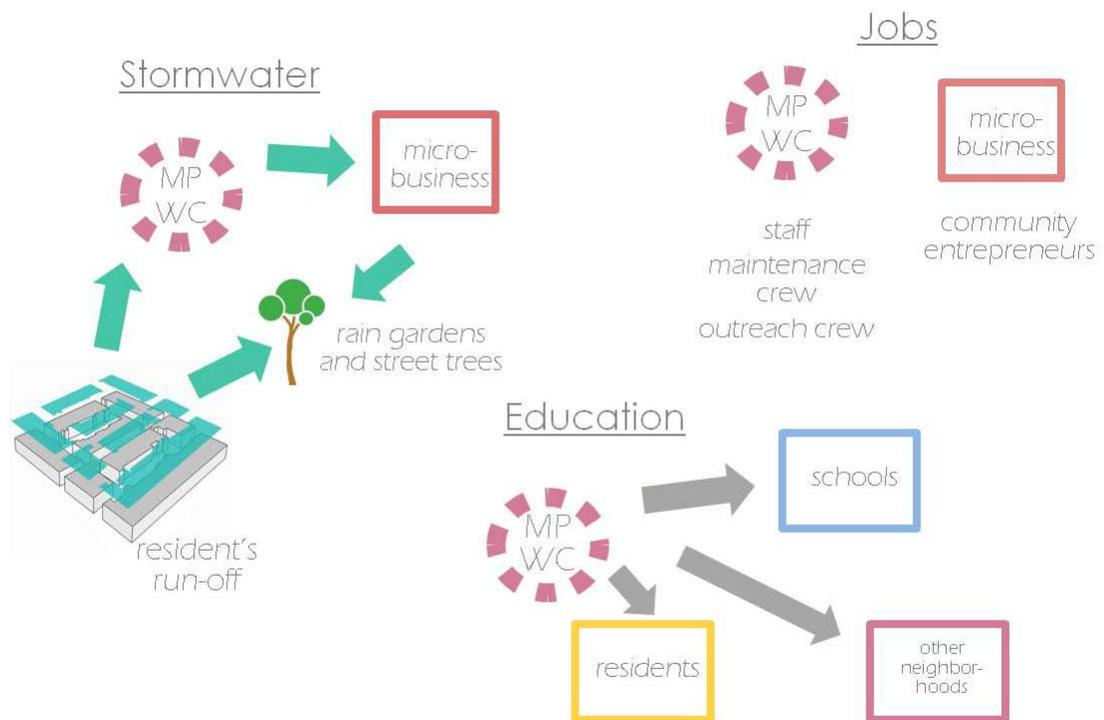


Figure 78: Water Collective Resources and Services

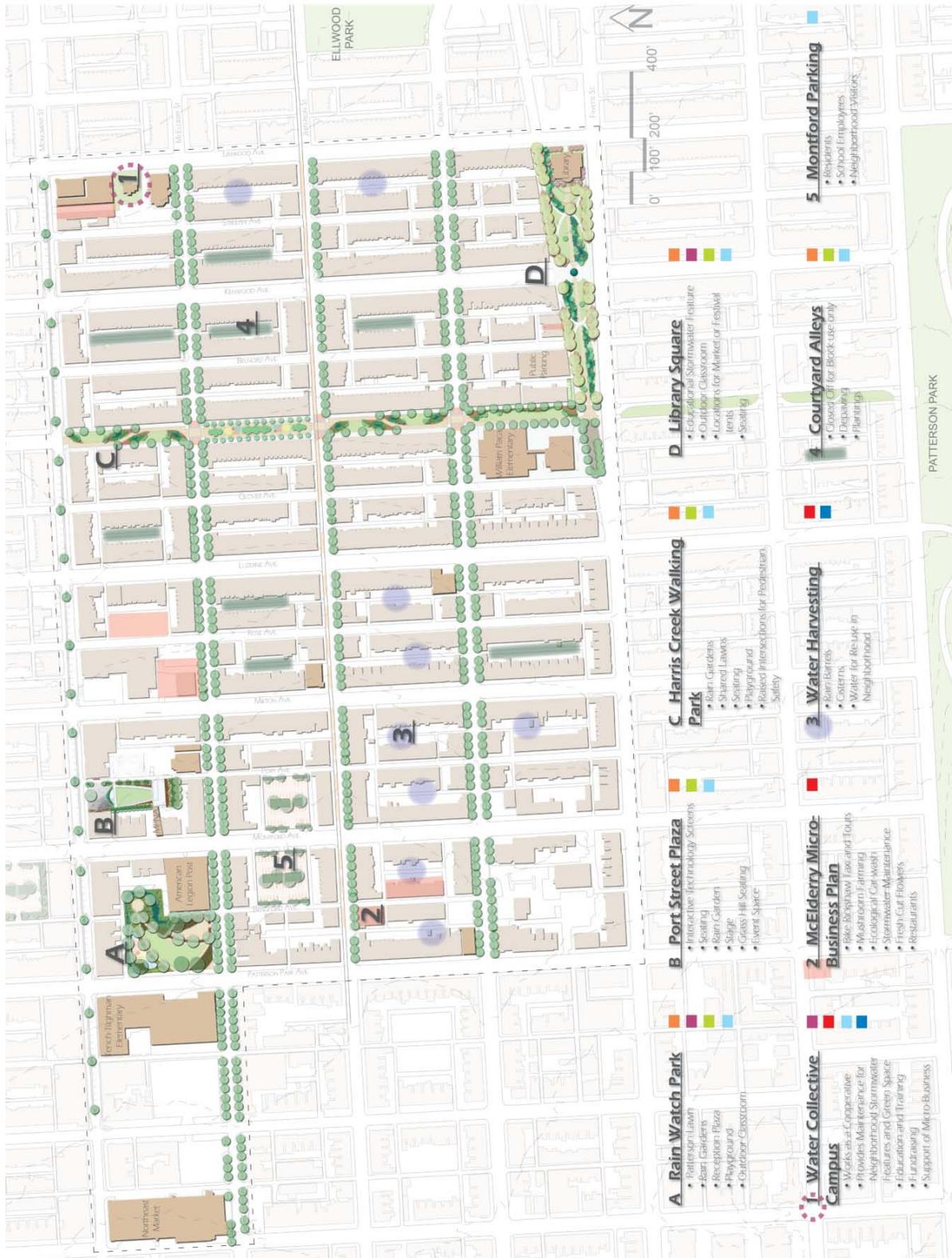


Figure 79: McElderry Park Stormwater Master Plan

Alleys

For now, the designer proposes that residents join (buy in) the Water Collective, block by block. Per the McElderry Park Stormwater Master Plan, certain blocks are designated as Stormwater Harvesting Blocks and others are Courtyard Alley Blocks. These blocks each have a specific focus: Water Harvesting Blocks use rain barrels or shared cisterns to store water for micro-business uses or watering of street trees and other green spaces in times of drought. The Water Collective will oversee harvesting and dispersal of the water. Courtyard Alley Blocks focus on creating green space within the block system that infiltrates stormwater and also serves as shared recreational or gardening space for the block residents. The Water Collective serves as a technical and policy resource for these blocks as well as having a Tool Library for block residents to do maintenance. The Courtyard Alley Blocks can also contract with The Water Collective to do



Figure 80: Proposed location for the Water Collective

maintenance. Alleys not designated for either of these uses will be encouraged to become parking alleys (with residents using their rear yards as pervious parking areas). Again, the Water Collective serves as a technical and policy resource for residents on these blocks. In all instances, the alleys now serve positive uses, have more user interaction, and will receive more care and attention.

Micro-Businesses

Several economic opportunities along with potential sites for these opportunities (Figure 78) presented themselves as natural outgrowths of treating stormwater as a resource. Jobs are a primary desire of the community and using stormwater infrastructure as a means to grow economic opportunities and jobs is an important part of the neighborhood programming elements. The Water Collective requires administrative staff as well as educational outreach staff and maintenance staff. These jobs should be either offered to community residents or provided to temporary bridge employees while residents are trained to take on the tasks.

The micro-business opportunities build on the entrepreneurial activities already extant in the neighborhood. The goal with micro-business opportunities is to set them up for success. In this regard, the Water Collective acts as something of incubator. For the first six months to a year, the micro-business will receive support in the form of funding, free rent, access to expertise and advertising through the Water Collective. As the micro-business begins to make a profit, then it begins to repay the Water Collective a percentage (2-10%). Since the Water Collective will

be acting as landlord and resource provider for the micro-businesses, when the micro business is successful, it begins to fund other micro-business and provide a return for all members of the Water Collective. Of course, the micro-businesses are required to hire residents of McElderry Park.

While there is a list of potential micro-business opportunities ripe for McElderry Park, two examples are outlined in some detail here: Hand Car Washes and the Baltimore Big Trike Tours. Hand Car Washes are already part of the neighborhood scene. This micro-business opportunity builds on this tradition by using stormwater to wash vehicles and then capturing wash water runoff in a bio-retention swale. The benefits: using harvested stormwater (instead of the current practice of using potable water); using only biodegrade soaps; keeping car washes accessible while increasing appeal to a broader audience by including those who seek ecologically sensitive car care options. Ideally, several residents would ‘buy-in’ to this business opportunity to ensure that the site would have functionality throughout a working day.

The Baltimore Big Trike Tours build on Baltimore’s strong biking community, both in McElderry Park and throughout the city. In McElderry Park, kids and adults (primarily young men) ride bikes on which they can get around the neighborhood quickly and show off. Baltimore City is increasing bike lanes and encouraging biking as an important form of transportation. When McElderry Park residents in the Neighborhood Working Group combined these two ideas in conjunction with their proximity to Downtown, Canton and Fells Point, they

developed the idea of bike taxis or rickshaws. These are available in cities like New York and Washington, D.C. and McElderry Park has the property to house these bike taxis, the know how to care for them, and the people to pedal them. The proposed name is playful, just like Baltimore. Ideally, Baltimore Big Trike Tours would provide taxi service and tours and a special service to McElderry Park residents who wish to pick up groceries at one of the larger grocery stores in Canton or Fells Point.

These and the other proposed micro-business opportunities address many issues in the neighborhood aside from the need for jobs. Providing ecological and historical education, exercise, access to a wider food selection, linking neighborhoods, are just some of the extenuating benefits that these small businesses would provide the neighborhood. Obviously, other job creating micro-business opportunities should be considered.

- Eco-Car Wash (Harvested Rain-water/Bio-infiltration of run-off)
- Mushroom Farm (Retrofitting Interior Block Row Homes)
- Baltimore Big Trike Taxi and Tours (Bike Rickshaws Housed and Maintained in Retrofitted Row Homes and washed using harvested rainwater—Using Pedal Power to move people around the Inner Harbor, Fells Point, Canton, and McElderry Park)
- Gutters and Gardens (Stormwater Management Features Maintenance)

- Fresh Cut Flowers (Using Row Homes Missing Roofs, Hardy Flowers are grown to supply local restaurants and suppliers).
- Restaurant Revolve—using existing infrastructure, provide local entrepreneurs the opportunity to be chef for a week without having to invest in a location. This opportunity will allow them to see if a restaurant is in their future.

Pervious Parking Lots

The Master Plan provides four new parking lots and suggests that an existing building be retrofitted to become a parking garage. While parking is available for most residents, there are parking concerns along the Monument Street Business Corridor, for the Tench-Tilghman Elementary School employees, for the William Paca Elementary School employees, and for visitors to Library Square. The new parking lots address all of these areas. Parking lot A, is north of the neighborhood boundaries, but as this area has been designated for Monument Street Parking before, it was incorporated in the Master Plan. Parking lots B and C are placed in proximity to the Tench-Tilghman Elementary School, the American Legion Post, the Neighborhood Community Association, Amazing Grace Church, as well as the Monument Street Business Corridor. The construction of these two lots requires the acquisition and demolition of several row homes, however, these blocks were chosen due to the high rate of vacancy. Community members identified these blocks as problem areas.



Figure 81: Parking Lot Diagram

Parking Lot D and Building E serve the William Paca and Library Square areas. Again, the parking lot is pervious, with planted bio-retention areas. Building E currently stands empty. While a thorough engineering study would be required to determine if the building could convert to parking, it has multiple potential access points, and high ceilings.

The Master Plan proposes that these lots are owned and managed by the Water Collective. Moving forward one benefit of this arrangement will be that in the case of future development, the community could use the parking lots as potential sites. In this way, the community could exert more control over what develop takes place in the neighborhood.

General Master Plan Features

While the master plan focuses on McElderry Park, it reaches beyond the boundaries to link to the broader community while encouraging an increased sense of place within the neighborhood. Some of these connections are physical and some are psychic. The Master Plan identifies particular pedestrian, bike and vehicular routes along Monument St., McElderry Park St., Jefferson St., and Lakewood Ave., and Linwood Ave., that connect the neighborhood to the surrounding areas. Monument Street reaches to the Hopkins Campus to the East, Ellwood Park to the West and Bocek Park to the North; a pedestrian corridor in the form the Harris Creek Walking Park connects McElderry Park to Patterson Park to the South. The new street profile and parking on Monument Avenue is pedestrian and bike friendly and along with increased green parking lots invites visitors to the commercial corridor.

In creating a sense of design cohesion and sense of place, the primary theme is stormwater. Visitors will know they are in McElderry Park as they move through the neighborhood and see the role water plays in the neighborhood. The design interventions make water the central focus and celebrate water. Materials are chosen for pervious and functional qualities, but reflect the urban setting. Plantings are also chosen for their role in stormwater management, but bright colors and year round interest are key. Evergreens are matched with perennials and ease of care is

taken into consideration. Consistency in materials and plantings adds to the sense of place.

Focus Sites

Due to the variety of design elements, certain areas of the master plan are examined in greater detail. These focus sites consist of the following: A) Rain Watch Park; B) Port Plaza; C) Harris Creek Walking Park; and D) Library Square. For all graphics related to the design of these sites, see Appendix A.

The new Rain Watch Park will be 1.1 acres and provide a playground,

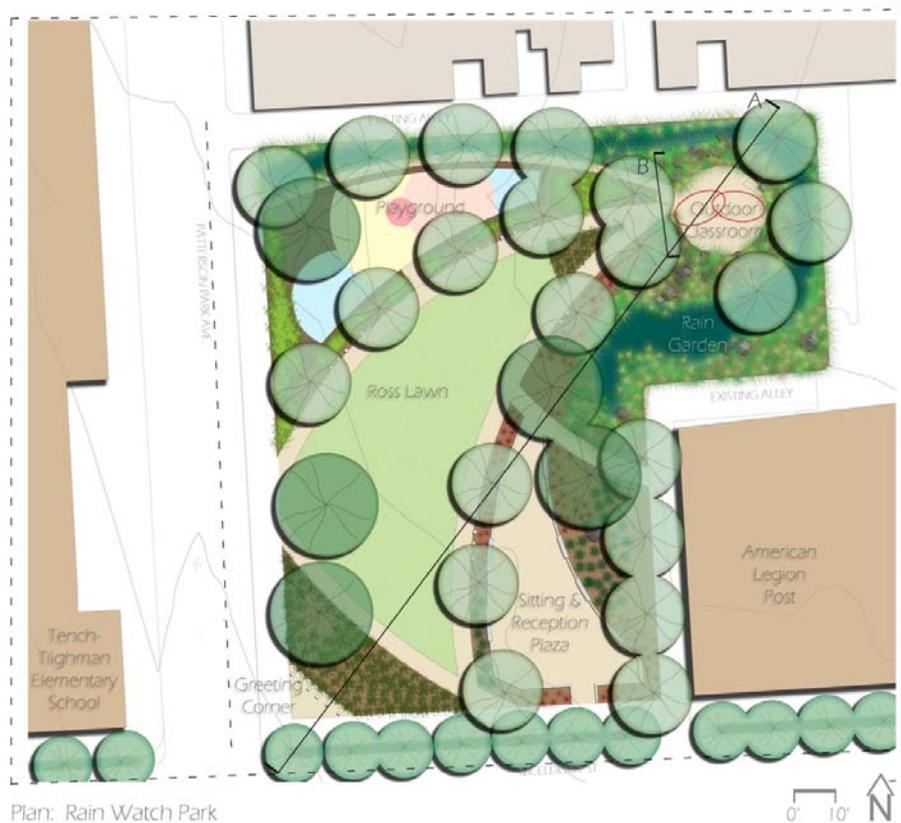


Figure 82: Rain Watch Plan

outdoor class-room, grand lawn, and educational opportunities for Tench Tilghman Elementary while offering a unique park for the neighborhood. The park is identified by the Center for Watershed Protection as a potential bio-infiltration site, and this plan's rain garden captures all surrounding run-off. Teachers will work with Living Classrooms to develop a curriculum based on the rain garden, the water cycle, and animal habitat. The outdoor classroom is covered by a see through cover in order for visitors to watch the rain. The great lawn and new playground provides substantially more play area. While a half basketball court is moved, there are three such courts within a quarter mile and it does not get much use during the school day. A seating surrounded patio area adjacent to the American Legion building accounts for the Legion's activities and the need for photo opportunities.



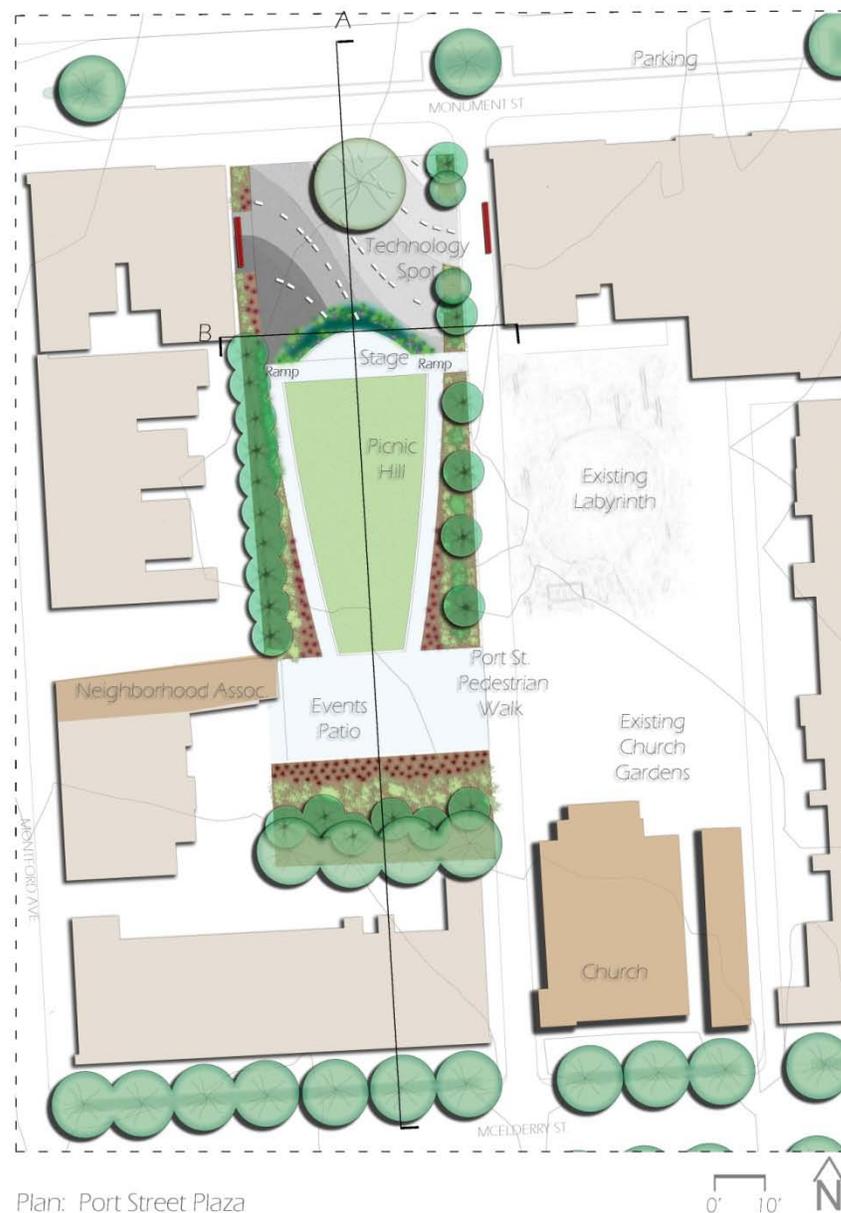
Existing conditions: View from southwest. Asphalt playground surface; water ponds on asphalt due to poor grading. Parking lot fills half of site.



Proposed Perspective: View from southwest. More than triple the trees and seating. Space defined for variety of users and uses.

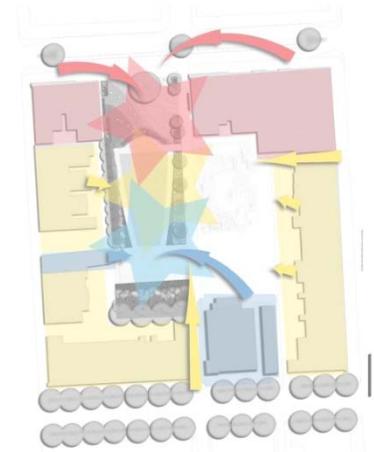
Figure 83: Rain Watch Park Perspective

The Port Plaza site is a little more than a half acre and serves as an activation site for the commercial area of the neighborhood. Port Plaza not only provides a gathering place for shoppers and visitors to the Monument Street commercial district, but two large screens on both the East and West side of the plaza permit technological programming for music, light, movie, and educational shows.



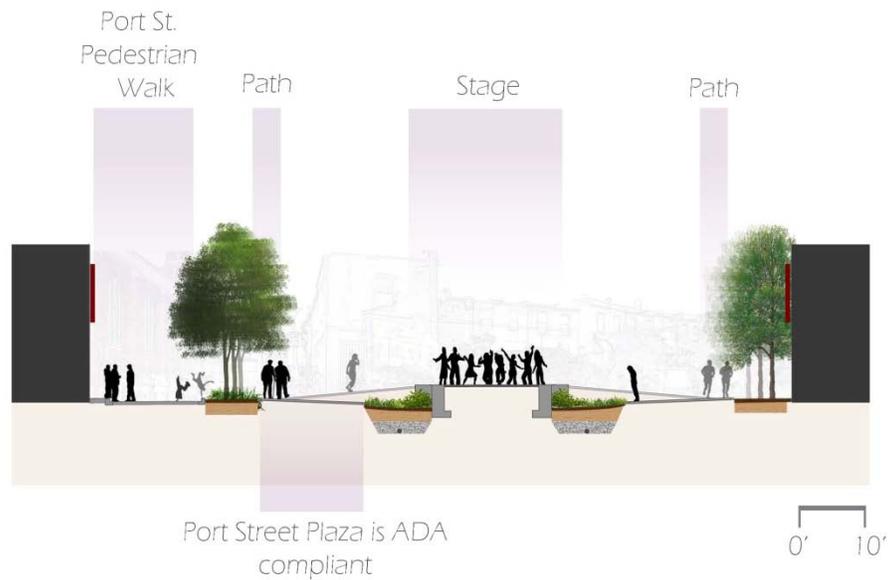
Plan: Port Street Plaza
Figure 84: Port Plaza Plan

There will be opportunities for interactive programming, as the technology will permit content flow from the visitors to the screens and vice versa. The primary plaza area leads to a large sloping lawn that looks onto an outdoor patio/theatre. As the site moves from Monument Street to McElderry Street, the activity level reflects the surrounding land use; more active toward the commercial street and calmer toward the residences and church.



Land Use and Site Activation

Figure 85: Port Plaza Land Use and Activity



Section B: Technology Spot from east to west looking south

Figure 86: Port Plaza Section

The Harris Creek Walking Park consists of 1.2 acres that was once Lakewood Avenue. This park provides the specific recreational purposes of a walking loop and playground, while adding rain gardens that can manage the run-



Figure 87: Harris Creek Walking Park Plan and Sections

off from the catchment area for the 10 yr 24 hr design storm. Harris Creek Walking Park evokes the historic Harris Creek River that once ran along where a portion of Lakewood now sits in McElderry Park with its curvilinear paths and plantings. The playground sits toward the middle of the Harris Creek Walking Park and serves a part of the neighborhood that felt underserved in this arena. Harris Creek Walking Park acts as a commons for the row homes that front on the Park. These residents will have a shared front yard and ample space to hold community event. The pervious paving paths are emergency vehicle accessible.

The Library Square site is 1.8 acres in the southwest corner of the neighborhood. Sitting at the bottom of the neighborhood topographically, this is



Figure 88: Library Square Plan

where the stormwater runs to, both above and below ground. Because of this, the site provides a stormwater educational opportunity which ties in well to the school and library institutions located on the site.

The primary goal of the design is to make the water visible. This is achieved through lightly stepped rain gardens and the Storm Drop. The rain gardens manage the run-off for the catchment area for the 10 yr 24 hr design storm and provide a strong visual feature. Plantings and seating build around the rain gardens. Visitors are able to walk to the edge of the rain gardens as well as enjoy them from the primary and secondary pathways. The primary axis leading to the library pulls seating into the site to encourage greater use; both as an outdoor classroom, theatre



Section: The Storm Drop: A view to the storm drain, showing visitors where the stormwater run-off goes.

Figure 89: Library Square Section

or just everyday reading and relaxing. The library stairs have been removed in favor of a long sloped (less than 5 percent) path (the main axis), which provides universal access through the main door. The Storm Drop feature is intended to serve as an educational as well as lighting feature. Using the existing infrastructure, a construction weight glass panel is installed to allow visibility into the large storm drain at this location. Lighting downward permits visitors to see what happens to stormwater at all times. At night up-lighting draws visitors for special events. Signage throughout Library Square and at all sites will be an essential component.



Conclusion

The most remarkable outcome of this design research thesis is the manner in which community members identified how stormwater could serve as a resource for their neighborhood. Using stormwater as a generator of economic opportunity grew directly from input from residents. Specific stormwater related jobs were identified by residents as well as site observations. Without the long and varied engagement with the community, the residents' needs and desires may not have played as significant a role in the development of the design goals and design response.

Community engagement has also engendered community buy-in regarding the Stormwater Master Plan. As of this writing, already several McElderry Park residents have taken ownership of stormwater (Street, Edwards-Myers, Smith, and Wirth). These residents view the storm drains differently and want to keep the garbage out of them. The big question for the residents involved in the process now when the Stormwater Master Plan will be implemented. While resident education regarding stormwater was not an explicit goal of this design research project, it was a direct effect for some residents who were involved with the project.

Finally, the designer found that community engagement informed site analysis significantly. Initial site observations may have been misconstrued if not

considered in light of information from the community engagement process. For example, the designer was ready to recommend that several corner stores be slated for demolition or other use based on building appearance and community leader input. However, residents depend on those corner stores for regular purchases. This example speaks to Kwinter's warning regarding the unintended consequences of urban revitalization (Kwinter, 2010). Fortunately, because this project included the voices of the community, the Stormwater Master Plan did not remove an important community resource.

NEXT STEPS:

The McElderry Park Neighborhood Association is putting the Stormwater Master Plan up for public review comment. After a month, the designer and Association Board will be available at the end of a community meeting to answer questions and take comments in person. The board will vote on whether or not to adopt the plan. Then a committee will be set up to pursue funding. If this is the case, the designer has agreed to volunteer technical assistance.

In the meantime, the designer is meeting with several community members and stakeholders who have an interest in specific sites and programming elements. The Tench-Tilghman Elementary and American Legion, the Patterson Park Branch of the Library and the William Paca Elementary School, and the Amazing Grace Church. This is in conjunction with a neighborhood outreach coordinator from Banner Neighborhoods who is also on the board of the Neighborhood Association.

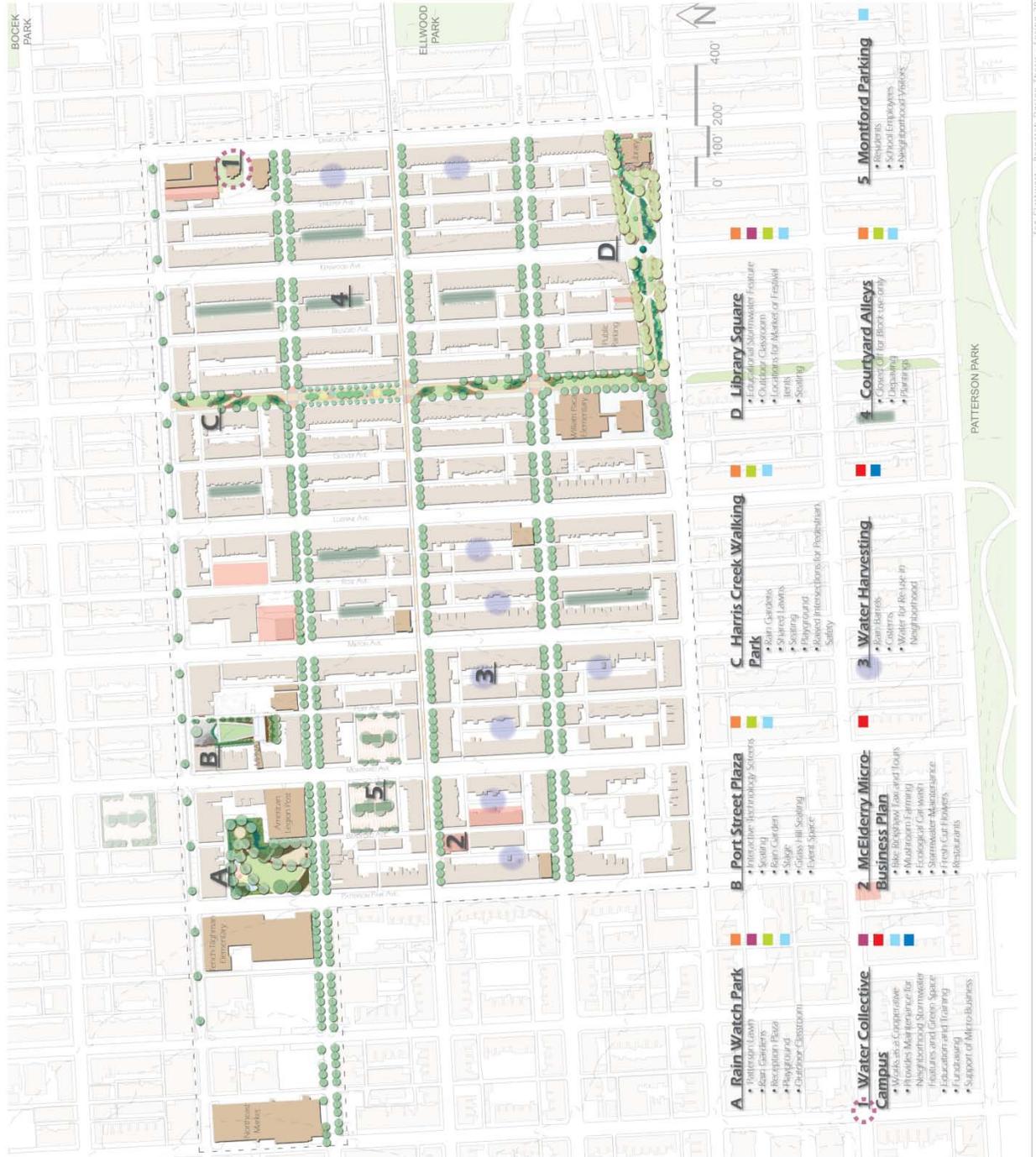
She sets up the meetings with interested parties. The designer comes to answer questions and respond to concerns. The designer has clarified to the Neighborhood association and all parties that the Stormwater Master Plan must reflect what the neighborhood wants; the proposal is malleable. With work, McElderry Park residents will shape their Stormwater Master Plan and the future of their neighborhood.

Appendix A -- Presentation Boards

MCELDERRY PARK STORMWATER PLAN

Design Objectives

- **Activate**
Eyes on space
Mixed uses and users
Destination points
- **Educate**
Curriculum development with Living Classrooms
Job training
Community outreach
- **Recreate**
Increase green space
Playground access
Seating
Exercise access
- **Employment**
Micro-business Plan
Water Collective
Maintenance Crew
Water Collective
Outreach and Training Staff
- **Infiltrate**
Capture runoff
Increase pervious surface
Use pervious materials
- **Harvest**
Implement rain barrel cistern collection system



RAIN WATCH PARK

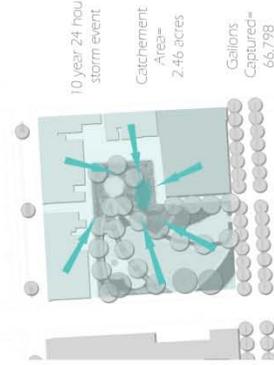
- Design Objectives**
- Activation
 - Education
 - Recreation
 - Infiltration



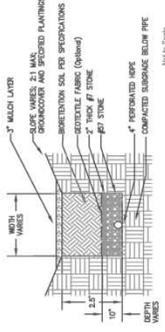
Location Map



Plan: Rain Watch Park



Proposed Stormwater Catchment Scheme



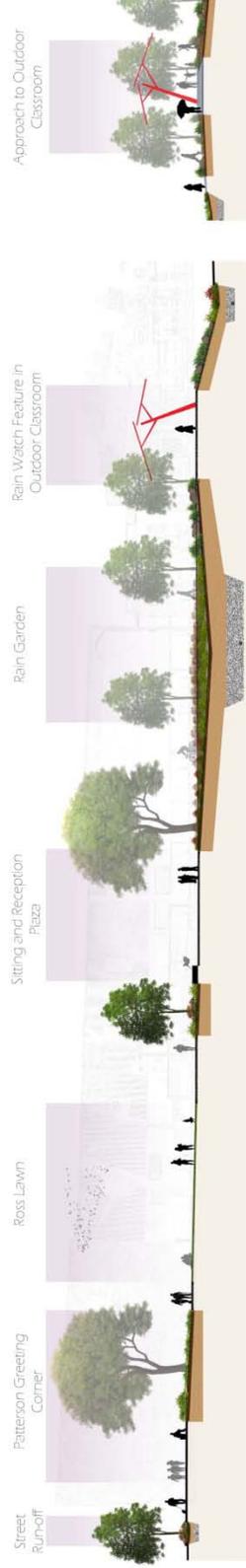
Section: Rain Garden (Bioretention Cell); found throughout Stormwater Plant. Based on Prince Georges County and the Low Impact Development Center's technical specifications.



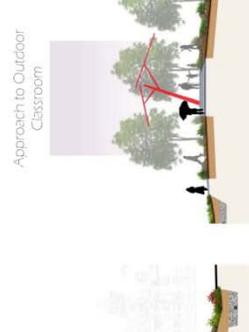
Existing conditions: View from southwest. Asphalt playground surface; water ponds on asphalt due to poor grading. Parking lot fills half of site.



Proposed Perspective: View from southwest. More than triple the trees and seating. Space defined for variety of users and uses.

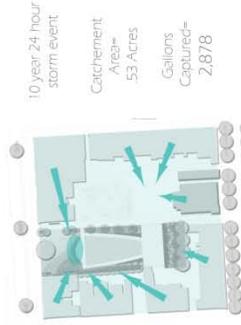


Section A: From McElderry St. to Monument St., looking northwest



Section B: Looking east

PORT STREET PLAZA



Proposed Stormwater Catchment Scheme



Existing conditions: View from Monument St. Currently, Port Pedestrian Path entrance is not marked. Three rowhomes will be removed (right). Two are vacant.



Existing Conditions: View from McElderry St. Residents want space to be better used.



- ### Design Objectives
- Activation
 - Recreation
 - Infiltration

Commercial, Residential and Institutional stakeholders provide variety of events and users.

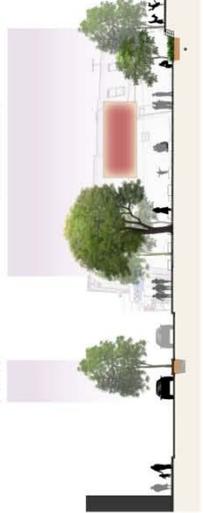
Technology focus promotes local businesses, provides public announcements and youth interaction opportunities.

Monument St. side activity transitions to passive recreation and event space McElderry St. side

Land Use and Site Activation



Section B: Technology Spot from east to west looking south



Section A: From McElderry Avenue to Monument Avenue, looking east

HARRIS CREEK WALKING PARK ...

Design Objectives

- Activation
- Recreation
- Infiltration

Harris Creek Walking Path is .6 miles
Walker's Loop is .13 miles
All residents live within a quarter of a mile of green space

Proposed Stormwater Catchement Scheme

10 year 24 hour storm event
Catchment Area= 4.54 acres
Gallons Captured= 24,655

Perforated pipe acts as underdrain for rain gardens and whole of block
Risers have low-flow and high-flow openings
Pipes run drainage to existing catch-basin/man-hole at each street

Schematic Section: Underdrain, overflow risers, and pipes for Harris Creek Walking Park: Rain Garden Chain

- 48' wide street
- two way traffic
- parallel and angle parking
- low point of neighborhood
- low traffic volume
- street play

Proposed Exercise Paths and Green Space Access

Section A: Harris Creek Walking Park

Section B: Play Area and Kids Bosque

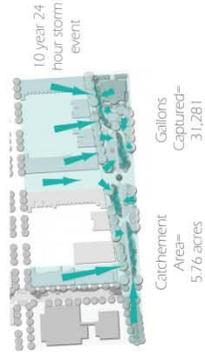
Existing Conditions: Facing west

Proposed Perspective: Pavement replaced by plantings

Plan: Harris Creek Walking Path (cont. below)

Joe Carretti - Research Design Thesis - Spring 2012 - University of Maryland, College Park

... AND LIBRARY SQUARE



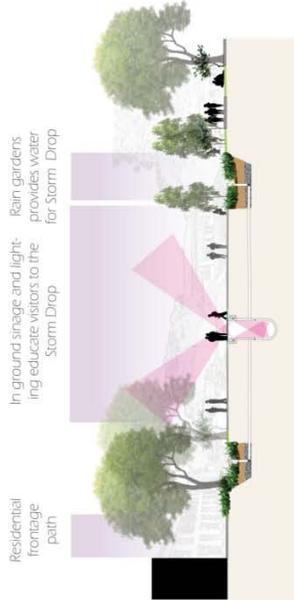
Proposed Stormwater Catchment Scheme



Existing Conditions: Low Point of neighborhood; pedestrian path leading to library.

Design Objectives

- Activation
- Recreation
- Education
- Infiltration



Section: The Storm Drop. A view to the storm drain, showing visitors where the stormwater run-off goes.



Plan: Harris Creek Walking Path (cont.) and Library Square

Appendix B -- Community Engagement Notes

1 ▪ March 18, 2011 – Ed Sabatino, Executive Director of HEBCAC

This was a short 20 minute meeting. Ed was remarkably difficult to get a meeting with and he did not have a large slot for the meeting. He is very personable, but distant. Clear that he does not want to get pulled into anything that does not benefit the neighborhood/bring in money, etc. It is also possible that he is not interested in working with this neighborhood for other reasons which may become clear as I move forward.

His suggestions:

1. opt for tool kit approach rather than a masterplan; masterplans tend to sit on shelves and get no movement. He says that communities need options that individuals and groups can choose from and implement on their own.
2. Watch the housing issue. The community is very protective of the housing stock as it stands, but don't be afraid to make a suggestion/tool for what to do with vacant houses
3. Address cost up front. If not economical then not going to happen
4. The city has long ignored this part of the city, he does not believe the city will give it any attention in the future
5. BUT McElderry stands a chance for redevelopment, from outsiders

2 ▪ March 20, 2011 – Christina Bradley, Slater Associates, Inc. Main Street, Pigtown Neighborhood, Baltimore

This was an hour long meeting, she is working on a complete streets plan for the main street in Pigtown. Pigtown is an urban, rowhouse neighborhood with issues similar to McElderry Park. Her big concerns are long term fundraising, up keep, jobs and over all development of the area. Can the street development be a catalyst? This was a great deal of brainstorming and focused on neighborhood based actions. They will be using Neighborhood Design Center's Better Block Project this fall.

3 ▪ March 21, 2011 –Ernest Smith, Director of McElderry Park Community Association and Beth Meyers-Edwards, Community Outreach for Banner Neighborhoods

This was an hour and half long meeting with both Beth and Ernest. They addressed the MMFRP plan from 2006 and Ernest expressed that this was the community's plan to follow and that what I do should grow out of that. I asked how things have changed since the plan. Other than the changes in the economy, Ernest seemed to feel that nothing has changed. For him he says that the goal of the community is "Revitalization without gentrification."

Beth and I discussed how to engage community members and how to address open space and storm water issues with community. We talked about framing and education. A

community member, Cynthia, came to talk with us for a moment, she said that “open space should be about health issues.”

Beth noted that discussion needed to be accessible, no academia.

Beth says there are people I need to talk with: someone about health issues, someone about the Harris Creek Watershed. Someone about the trees. Mark with DOT about the Jefferson complete street. Beth will send me names.

Ernest said that he would like a product by January.

4 ▪ March 22, 2011 – Phone Meeting with Drew Bennett of the CARE Neighborhood, part of the MMFRP plan, directly to the west of McElderry Park.

CARE is looking for a new detailed master plan that encompasses, residential, commercial, school, planning. They are in the process of doing educational outreach surrounding trash and stormwater. He does not feel that a plan that addresses SWM is what the community needs at this time. Asked that I send him any info on Storm Water, pollution etc. that I have. [I did this.]

5 ▪ March 23, 2011 – McElderry Park Neighbors’ meeting

I organized this meeting through Antje Wirth and Robbyn Lewis (from PPNA—Patterson Park Neighborhood Association). They brought together Antje Wirth, Thomas Wirth, Shannon Sneed, Raymond Sneed, Pam, Rabi Carson, Kenneth Helmsley and Robbyn Lewis. All but Robbyn live in McElderry Park (Robbyn live right next to McElderry Park). They have all been actively involved in prior neighborhood efforts (which is how Robbyn, a community activist) knows them.

I presented the thesis design project and a general overview of my research/design goals basic site analysis and asked them about the needs of the neighborhood and constraints and opportunities. They were all supportive and gave specific feedback:

- Antje envisioned green roofs, and community vegetable gardens
- Pam suggested helping people plant their back yards
- All expressed a desire for an all encompassing master plan that directs the future of the neighborhood.
- Several noted the need for neighborhood cohesiveness and identity

They are looking for actionable steps in a plan that they can do as community members. Very interested in Green/open space. Want the park in McElderry Park. Need more information about how SWM fits into green space, but get that the two are related. Like the tool kit approach, but definitely want a Pretty Picture plan at the end of it. Also seem interested in having performance measures. Feel like this could help them get funding. Do not perceive things as obstacles, but like to move forward.

Big concerns—

- cemented back yards
- garbage/dumping
- lack of open space

- vacant houses

They mostly want to know what the next step is. I explained that the next step is community engagement in a particular format—that there are particular goals and objectives that I have to achieve as a student and so I will review what has happened thus far with my advisor and will prepare for future workshops and then go from there.

6 ▪ April 4, 2011 —Glenn Ross, Environmental Justice Activist, and McElderry Park resident (1980s-present)

Glenn Ross is well known in political circles and has been the subject of several stories in the city paper and urbanite for his work exposing toxic sites in Baltimore. He was very generous with his time despite being in the middle of radiation treatments for cancer and fighting foreclosure on his home. For many years his living room served as his office. After several health scares, including diabetes, stroke and breast cancer, he is dismantling his office and trying to slow down. However, he showed me his calendar and it is packed. Unfortunately, much of his work is unpaid. He gives tours to academics and city officials of Baltimore sites that detail environmental injustice. He would like to give these tours to the people who live in the neighborhoods, but the cost is prohibitive.

He covered a broad array of topics and it was difficult to get him to stay on “green space in McElderry Park”. The notes below are reflective of our meeting. Ross says Hopkins has a hand in EBDI and HEBCAC. They along with the city have tried to break the neighborhood by discouraging funding, projects and neighborhood development. He says the goal of Hopkins and the city is for the neighborhood to be cleared for larger development by Hopkins and large scale developers. Ross claims that neighborhoods are susceptible to this due to lack of education and leadership and because the advocacy groups that do exist have differing agendas and an unwillingness or inability to share resources.

He says the bright spots in the broader area are Civic Works, MICA’s involvement, and projects in nearby Patterson Park and Butcher’s Hill.

Ross likes to note that his community planning tools are a bat (safety) and broom (clean up).

Natalie Tranelli, a student from MICA has done a documentary on his work and life--
<http://vimeo.com/user5424425>.

7 ▪ April 4, 2011 —Dr. Ray Bahr, Environmental Activist, President, Harris Creek Watershed Association

Dr. Bahr is a retired medical doctor, who has researched the now buried Harris Creek which once ran to the east of McElderry Park. The watershed encompasses several eastside neighborhoods, but all that remains is the out fall in Canton. He has championed clean ups, and ensured the installation of a continuous garbage gathering device at the out fall. Currently, his attention has turned to the neighborhoods up stream. He works with city and neighborhood leaders on issues such as dumping and storm water education.

When we meet he gives me a quick history of the Harris Creek Watershed:

- 1812 Britain called American's Pirates—he claims first navy ship was built in Harris Creek
- Canton Can Company and its importance in the industrial revolution—it was canning center of the world
- First bridges at the neck of the Harris Creek (where it enters the Inner Harbor)
- Around the turn of the century the Harris Creek was filled in/channeled.

His goals are specific to cleaning the Inner Harbor through cleanups, greening, and developing trust.

Asides are that he views environmental justice and medical apartheid as part of the city's big issues. He notes that the CPW may be doing projects in parts of the watershed in the future.

8 ▪ April 6, 2011—Duncan Stuart , Watershed Liaison, Surface Water Division, DPW Baltimore, MD

Mr. Stuart works with many communities as they develop neighborhood plans to address storm water management issues. Given that DPW and DOT overlap in their jurisdiction and policy development, based on conversations with neighborhood stakeholders it seemed important for me to talk to someone from each department in order to understand how they impact and respond to neighborhood development plans.

Mr. Stuart outlines DPW's work accordingly: DPW takes policy and plans to the politicians who determine the budget and then get to choose which community they are able to work with. In short there are many community projects that DPW has no budget to cover.

We discussed how/if the DPW monitors storm water. It does not. He directed me to DOT and noted that he is aware of stream monitoring, etc., and Baycheck's work in water

quality. That said, he knows that funders love to hear “monitor”. Funders like the idea of measurement of one practice.

Then conversation jumped around: Impervious Surface: 3rd most expensive way to add green space is to remove impervious surface—if city does it, it can be more expensive [this just sounds strange to me]. He recommends a program called Depave and suggests that communities do themselves and seek outside funding. He says Jim Kraft—McElderry Park’s council person, is a man who can help make these projects happen—but it turns out that Warren Branch is McElderry Park’s City Council person and that no one in the neighborhood speaks positively of his work. (He won the recent election by 40 votes.)

9 ▪ April 11, 2011 —McElderry Park Neighborhood Association, meeting with Ernest Smith and Beth Meyers-Edwards

Two hour meeting. I report to them on the meetings I’ve had and we discuss upcoming workshop.

- Ernest Smith has talked with Councilman Jim Kraft about the potential of my masterplan
- Ernest Smith wants more trash enforcement, there are numerous concerns about code enforcement
- Ernest Smith wants special grates on storm drains (I’m still not clear on what these are)

Potential water issue places according to Ernest Smith—primarily based on storm drains being plugged by garbage

In discussing potential workshop dates and structure Ernest and Beth suggest the following:

- Advertise lots of info upfront to get people to know about session
- Keep people on topic
- Let people know upfront that we are aware of trash issue
- Stay solution focused
- Can’t count on having multiple meetings, so try to get as much from one meeting as possible—don’t ask for 2-3 meetings up front cause it scares people away, they are commitment phobic.
- Keep the meeting short, sweet and easy for the community members to comprehend
- Can advertise by flyer, community newsletter and website

Ernest wants the master plan to take into consideration how jobs can be brought to McElderry Park.

10 ▪ April 6, 2011—Mr. Warren Street, McElderry Park Resident and Greening Chair for McElderry Park and for Parks & Open Spaces Committee for MMFRP

This long time resident is almost 70, but still active in the neighborhood. He has a strong conceptual idea of what green space in McElderry Park should look like. “We want the suburbs in the city,” Mr. Street says. When I asked what that would look like, Mr. Street takes some time to answer. More trees, bigger tree pits, flower boxes and making sure that neighbors don’t drop garbage on the street round out his list.

11 ▪ April 17, 2011 —Baltimore Tree Trust Meeting—Trees for Public Health Study Proposal in McElderry Park—People at meeting: John Papagani (Lutheran Grace Church), Dick Gibbs, Jill Jonnes, Amanda Cunningham, Robbyn Lewis, Sarah Lord

Two hour meeting. Currently the primary focus of the Baltimore Tree Trust is this Trees for Public Health Study. They have some funding and are moving forward in seeking further funds. They wish to assess the benefits of tree planting in an urban neighborhood in Baltimore and they have chosen McElderry Park. There is a goal of planting 800 trees in the neighborhood. The hope is to plan 50 trees this fall. Surveys will be done before plantings and after.

The discussion moved through a series of agenda items:

- Funding for fall planting
- Arbor Day events
- Inventory of McElderry Park trees and potential funding

12 ▪ May 15, 2011—Baltimore Tree Trust Meeting—People at meeting: John Papagani, Dick Gibbs, Amanda Cunningham, Leonard Brady, Starr Brady, Jill Jonnes.

Series of agenda items:

- How to water street trees—can water be pulled from rowhome roofs and fed to tree pits? How to design it and how to pay for it
- Survey structure for public tree study—who will consult on it ? who will do it? Will it be done at the same time as tree inventory?
- What trees will city allow BTT to plant? How to get trees ok’d?
- Funding for fall planting
- Funding for tree care after planting
- Community buy-in

13 ▪ May 20, 2011—McElderry Block Party in preparation for summer

I go to assure that the upcoming workshop meeting is advertised and to talk with other organizations that will be represented at the party. I hand out flyers. Since I am already working with Banner Neighborhoods, and Grace Lutheran, I talk to a representative from Safe Streets on Monument Ave. She is not easy to talk with, but I learn that the program has been around since 2005 and focuses on outreach to stop violence [online research reveals that its focus is mediating gang violence]. She expresses that they have no ability to cooperate in anything other than their specific agenda.

14 ▪ May 23, 2011—Community Workshop, McElderry Park Neighborhood Association

Approximately 30 community members come out. After a slow start, only four people are there at the meeting start time, I open with brief discussion of green space as it pertains to cities and ask what the community member think of when they think of green space. All four people participate in the discussion and more community members trail in. We begin the mapping exercises. I have three mapping stations—one station has three maps. Stickers and pens are available and community members move from map to map and mark it up according to directions. There are at least two community members who don't want to participate, however, with the help of myself or the two people who are helping me manage the stations, we are able to mark the maps on their behalf.

Primary takeaways in no particular order—

- Day cares are important to the economy and life of the community
- People want job opportunities
- People want “better neighbors” (this means no crime, no drugs, and clean)
- People like the “idea” of green space and have different goals than “community leaders”—for example many people said seating is important, whereas community leaders do not want seating.
- People like the “idea” of water being incorporated into the neighborhood design.
- People are open to re-thinking potential spaces for green space insertion (not just vacant lots, but streets, and other locations can be considered
- That said, no one marked alleys as a potential spaces for green space insertion—the feeling is that the neighborhood has completely turned it back on the alleys
- People enjoyed talking about it—some moved toward dumping issue and other negative aspects, but many stayed on future potential
- Some people are quite willing to think outside of the box (roller coaster is not something one usually thinks of when contemplating urban design)

Approximately one hour meeting discussing outcomes from community meeting and the disparities between my expectations and the outcomes. Antje was at the meeting for longer and she points to several reasons for disparities and suggests how they may not actually be all that contradictory. The primary disparities were that I'd expected community members to choose the amenities of lighting and learning opportunities. I'd not expected the community to choose seating and water amenities. These expectations were based on earlier communications with community leaders and concerns regarding safety, education, cleanliness. However, educational opportunities received the fewest votes, and lighting the next fewest. Water amenities and seating received the most votes.

Antje suggested the possibility of people not fully understanding "learning opportunities", but she suggested that it also might not interest the community as much as the beautifying aspect as the other options. She also suggested that sometimes community members just put their stickers on everything, but in this cases we limited the number of voting stickers, so community members could not mark every item, but had to be judicious in choosing where to put their stickers; hopefully choosing those amenities that reflected what they actually wanted in their neighborhood.

Ultimately, Antje felt that the community meeting had been successful because of the manner of interaction and response from those attending. To a certain extent, I feel that if I had more time and a different agenda, the goal would be to build on that success to create a great sense of community through design—but that is not what this thesis is about—that said, there must be something I can grasp from the process that helps me get at neighborhood identity. In discussing this with Antje, she and I did cover the fact that the neighbors utilize the front of their homes—not the back—the alleys and back yards have become a no go place. From a design standpoint this is important—how do we keep the action in the front, but use the space in the back wisely and keep it safe?

Appendix C -- Stormwater Calculations

| Rational Method | q=CIA | provides peak run-off rate (cubic feet per second) which permits sizing of interventions (pipes, infiltration areas, etc.)* | Rate (Cubic Feet per Second for sizing pipes, overdrains, etc) |
|--|-------------------------|---|---|
| Using Rainfall Intensity from Technical Paper 40 10 year 24 hour rainfall = 5 inches for Maryland | | | |
| Neighborhood as a whole this is assuming the neighborhood drains into one location (which is more or less accurate) Tc (time of concentration) needed to determine Rainfall Intensity based on nomographs | | | |
| Overland 11 minutes | Length 2495 | Slope 0.017 | Channelled 13 minutes |
| | | | length 3521 |
| | | | slope 0.017 |
| i = Rainfall Intensity (inches per hour) | 6 | x.2 because channel is paved | 2.6 |
| A = acres | 89.9 | 8 | 1" storm event |
| C = Manning's Coefficient | 0.8 | 89.9 | run-off tot. 2335244 |
| q=CIA | q=(.8)(.6)(89.9) | 611.32 cubic feet per second | run-off tot. 841774 |
| | 431.52 cfs | | total area r 2446706 |
| | | | 1.02E+08 |
| | | | 0.348315 percent stormwater managed if all roof runoff is captured |
| | | | 0.966292 percent stormwater managed if all roof impervious runoff is captured |
| 1 US gallon = 0.133680556 32.0065.3 1.5 average depth of rain watch rain garden 215376.8387 the whole of one inch of rain in neighborhood in area of 1.5 ft depth 261.8331091 inches for pond with 1.5 ft depth which would hold whole of 325065.3 cubic ft | | | |
| 1647633 total cubic ft for 10 yr 24 hr storm on neighborhood | | | |
| 0.196078 percentage of stormwater managed | | | |
| cubic ft = 7,481 gallon | | | |
| Focus Areas | | | |
| Before Design | | | |
| Rain Watch Park | Tlength in Slope 523 | Tminutes iph 8 | Tc 0.019 |
| | | | Slope 270 |
| | | | 14 |
| | | | 5.5 |
| | | | 0.3 |
| | | | 2.46 |
| | | | 4.059 cfs |
| | | | 30.36538 |
| | | | 2416706 |
| | | | 1821.923 |
| | | | 2623569 |
| Port Plaza | section 1 156 | 0.023 | 13 |
| | section 2 100 | 0.023 | 6 |
| | | | 8 |
| | | | 4.2 |
| | | | 0.4 |
| | | | 0.39 |
| | | | 0.6552 |
| | | | 1.0652 cfs |
| | | | 12325201 |
| Linear Park | Section 1 461 | 0.013 | 8.5 |
| | section 2 291 | 0.01 | 6 |
| | section 3 230 | 0.02 | 8 |
| | section 4 437 | 0.022 | 7 |
| | | | 4.9 |
| | | | 0.4 |
| | | | 1.95 |
| | | | 3.12 |
| | | | 0.9438 |
| | | | 0.4 |
| | | | 0.57 |
| | | | 1.0488 |
| | | | 1.53 |
| | | | 2.9988 |
| | | | 4.54 |
| | | | 8.1084 cfs |
| | | | 7.481 |
| Library Sq | | | |
| Drainage Area 1 | 581 | 0.028 | 7.5 |
| | | | 6.8 |
| | | | 0.85 |
| | | | 2.76 |
| | | | 15.9528 |
| | | | 670 |
| | | | 190 |
| | | | 0.028 |
| | | | 12 |
| | | | 6 |
| | | | 0.5 |
| | | | 1.22 |
| | | | 3.66 |
| | | | 82500 |
| | | | 1.893939 |
| | | | 53500 |
| | | | 1.228191 |
| | | | 136000 |
| | | | 3.12213 |
| Drainage Area 2 | 587 | 0.034 | 6.5 |
| | | | 7.8 |
| | | | 0.85 |
| | | | 3 |
| | | | 1.89 |
| | | | 12.69135 |
| | | | 270 |
| | | | 0.018 |
| | | | 4.2 |
| | | | 0.35 |
| | | | 1.11 |
| | | | 1.8648 |
| | | | 14.56615 |
| | | | 5.76 |
| | | | 16.56655 cfs |

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<http://metosrv2.umd.edu/~climate/weather/marylandnormals.htm> (for the precipitation)

Additional Resources

Baltimore Green Space (<http://baltimoregreenspace.org>) provides a useful guide to turn abandoned lots into functional green spaces.

The Adopt-A-Lot Program can be used to assist neighborhoods in this process:
http://www.baltimorehousing.org/vtov_adopt.

The Community Greening Resource Network (<http://www.parksandpeople.org/greening/resource-network/>) provides assistance to community and school gardens across the City. Tree planting initiatives can beautify a street, clean stormwater, and provide additional benefits such as noise reduction.

Baltimore City's Street Tree Request Form
http://www.parksandpeople.org/files/resources/2464_Tree%20Planting%20Request%20Form.pdf

The Gating and Greening Alleys Ordinance allows the Department of General Services (DGS) to receive, evaluate and process requests for alley gating and/or greening. Generally, alleys are eligible if the adjacent structures are mostly residential; the alley is no longer needed for through pedestrian or vehicular traffic; and the gating and/or greening will promote public health, safety or welfare.

Baltimore City's Alley Greening and Gating Program
<http://www.baltimorecity.gov/Government/AgenciesDepartments/GeneralServices/AlleyGatingGreeningProgram.aspx>