STAKEHOLDER-BASED SUSTAINABLE DESIGN:
A PARTICIPATORY LEARNING MODEL

BY

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THESIS

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Abstract

Small mid-western towns face significant challenges in the creation of sustainable landscapes. Trends in 20th century development emphasized car-oriented design which drew businesses and people out of town centers, while subsequent economic downturns have left many towns with budget shortfalls and expensive, over-capacity infrastructure (Pigg 1991, 6-7). Adoption of sustainable design practices emphasizing human health and green infrastructure could have manifold economic and social benefits (Sullivan 2014, Wolf 2005). However, most information and resources regarding sustainable design practices are tailored to serve professionals working in suburban and urban environments. Citizens from smaller communities have few resources enabling them to identify and prioritize sustainable design goals. In this thesis, I examine the efficacy of a Learning Circle, a participatory learning model, in building the competence and confidence of stakeholders in Mattoon, Illinois to engage in a sustainable design process for their communities, and in facilitating buy-in within the community.
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Introduction

Encouraging adoption of sustainable design practice to mitigate a wide variety of environmental problems is the major challenge of our time. In too many areas of American Society, sustainable practices face both economic and cultural barriers to implementation. Most resources for sustainable design are passed between urban professionals, or are in documents tailored for use by urban practitioners. Moreover, most information available does not identify systematic design principles that underlie truly sustainable landscapes. Communities located outside these urban cores do not necessarily have either the professional connections or technical resources to implement sustainable design strategies.

Small mid-western towns face particular challenges in the creation of sustainable landscapes. In small towns across the country, historic business districts have been gutted as car-oriented design draws businesses and people out of town centers, and increased the prevalence of parking-lots within towns (Ben-Joseph 2012, 76) while subsequent economic downturns have left many towns with budget shortfalls and expensive, over-capacity infrastructure (Pigg 1991, 6-7). Adoption of sustainable design practices which emphasize human health and green infrastructure could have manifold economic and social benefits (Sullivan 2013, Wolf 2005). For example, increasing the urban canopy could increase foot traffic while decreasing the urban heat island effect and mitigating flooding during storms. However, leaders in small
communities have few resources enabling them to identify and prioritize sustainable design goals. This is especially important because rural and small town communities occupy by far the most land area in America, and environmental improvements in these areas could have a great positive impact.

We need new means of disseminating information about sustainable design into communities like this, which rely less heavily on urban professional networks, and encourage stakeholder participation. A participatory learning strategy, in which stakeholders discuss sustainable design ideas, in the context of their own communities' constraints and needs, could be an important way of accomplishing this goal. It seems that a Learning Circle, a meeting of stakeholders and experts who get together to exchange information as equals, could meet these challenges.

In this thesis, I ask, to what extent can participation in a Learning Circle build the competence and confidence of local stakeholders to engage in a sustainable design process?

To answer this question, I worked with Professor William Sullivan, the Lumpkin Family Foundation (LFF) and other Mattoon, Illinois, stakeholders. We formed a Learning Circle to discuss topics in sustainable design and establish sustainability priorities. We then engaged in an iterative design process for a park site located in downtown Mattoon. Finally, I evaluated the success of the process using a combination of surveys, analysis of the Learning Circle's discussions and interactions, and their sustainable design priorities as expressed in the final park design.

This document has three sections. Firstly, I overview existing literature on public participation in design and planning. Secondly, I describe our Learning Circle's process, including the reading and discussion phase, and the design phase. Finally, I evaluate this process's success with respect to our initial goals, and its potential applicability to other circumstances.
Public Participation in Design and Planning

Public participation is critical to creating the long-term societal changes we need to solve our environmental and infrastructural problems. While top-down policy change can be very powerful, without a reciprocal cultural change in individual actions, policy changes have little hope of being effective. In an era of extreme political gridlock, local change has the greatest potential for creating widespread environmental improvement. “Of all our institutions, local participation is best situated to help reform personal day-to-day unsustainable behavior because it represents the local part of thinking globally and acting locally” (Hester 1999, 22). Local participation, especially in sustainability related projects, could give individuals the opportunity, on the one hand, to understand negative environmental impacts in their own contexts, and on the other hand to take positive action.

In the field of landscape architecture, participation literature falls into roughly three categories: strategies for practitioners who want to manage and abbreviate the participation process to get their projects approved in cases where a fragmented public has the power to stop the project (Hester 1999, Faga 2006): strategies for conservationists hoping to achieve compromise among disparate land owners to achieve an ecological goal, such as restoring fish habitat or protecting an urban natural area (Jones 1999, McNally 2011): and strategies for environmental justice activists, who seek to empower socially and environmentally marginalized people to improve their local environment (Hester 1989, 1999, Brown and Jennings 2003).

Transdisciplinary Action Research (TDAR) is an emerging theoretical framework, usually grounded in academia, and used in both conservation and social justice contexts (McNally 2011, Thering 2011). In this framework, academic, professional, and ‘lay’ community members collaborate to translate research-based ideas into real world change. “By gathering the expertise and value systems of multiple disciplines and stakeholder groups as well as the expert and local knowledge cultures that are committed to a process of facilitating 'the social construction of knowledge,'” (Thering and Chanse 2011).

While Transdisciplinary Action Research advocates for equal collaboration among participants to bring diverse perspectives into the design process, methodologies for conducting this collaboration are diverse and specific to each project. Academics such as Susan Thering and
Daniel Stokols advocate for incorporating the study of TDAR methods into Landscape Architectural practice. For instance, Stokols advocates designing case studies grounded in theory, which gather specific data about the effectiveness of that theory (Stokols 2006, 74). In the long run, hopefully this will produce empirically tested methodologies for multiple public participation contexts.

One strategy for implementing the kind of community participation advocated for by TDAR is the learning circle. The Learning Circle is a specific method of public participation that has had broad success in many fields and is growing in popularity. A Learning Circle is a flexible strategy for education in which stakeholders with disparate knowledge-bases and agendas participate as equal partners, and a facilitator guides the proceedings.

Informal, yet highly purposeful in nature, a learning circle is a person-centered, experiential form of learning that brings together people who share a common goal and interest and enables them to explore topics relevant to this interest. (Ravensbergen & Vanderplaat 2010, 340)

This strategy can be more or less structured based on the needs of the group. It is a useful way of engaging in a rich educational process because “it maximizes the sharing and use of skills and experience of practitioners, and makes efficient and effective use of the tutor as facilitator” (Wade and Hammick 1999). The facilitator does not lead the process, but supports it. Widely used in Europe as an adult education tool, in American and Canada it has primarily been employed in social justice, health care and medical settings. In social justice work, action learning circles, a application of learning circles in action research, are used as a way of empowering under-served communities to gather empowering knowledge and expertise. In Canada, the program, Promoting the Mobilization of Low-Income People to Reduce and Eliminate Poverty, coordinates learning circles to:

- a) to explore the barriers to civic participation by people living in poverty; b) develop skills and capacities to increase civic participation of people living in poverty; and, c) identify government policies and community practices supportive of greater participation by people experiencing poverty. (Ravensbergen & Vanderplaat 2010, 342).

Learning Circles have also been used as a vehicle for cultural change in difficult circumstances such as those in a nursing home, providing an avenue for open communication between staff, family and patients (Norton 2003), and as a tool for continuing education among health care professionals (Wade and Hammick 1999).
In all of these circumstances, the key contribution of a learning circle, absent in traditional forms of pedagogy, is the explicit assumption that all participants will make an equal contribution to the learning process. Facilitators are present to keep the discussion on track and diffuse difficult interactions, but they do not necessarily need to have special expertise in the topic at hand, and the task of facilitation often rotates between different members. If they do, their role is to support the learning process of other members rather than disseminate information. The goal of a learning circle is for all participants to gain knowledge and empowerment in the topic at hand.

Through the use of a Learning Circle, we sought to increase stakeholder confidence and competence in sustainable design principles, and evaluate the extent to which the process was successful.
Context and Setting

The Lumpkin Family Foundation is a private, family foundation created in 1953 from the estate of Besse A. Lumpkin of Mattoon, Illinois. We make grants and conduct programs that support people pursuing innovation and long-lasting improvements in the environment, health, education and community access to the arts. (Lumpkin Family Foundation, 2014)

The Lumpkin Family Foundation (LFF) is a philanthropic organization based in Mattoon, Illinois. The family made its fortune in the telephone industry in the 1900s. The family patriarch, Richard Lumpkin, still owns Consolidated Communications, located in downtown Mattoon. The Lumpkin Family Foundation is based in the same building. Though the Lumpkin family is now scattered across the country, the LFF is still committed to serving Mattoon and east-central Illinois. Regionally, the LFF has supported a wide variety of community arts programs, sustainable food systems, conservation and clean energy; they particularly focus on the intersection of these interests with education. They recently purchased a small wind turbine for Lakeland College's renewable energy curriculum. Recent projects they funded in Mattoon include two prominent downtown murals, and a Community Arts Center in the historic Train Depot.

Mattoon, Illinois is a typical declining industrial town. Located at a historic rail crossing, its economy was originally based on locomotive manufacture and maintenance, and still...
relies largely on resource extraction and manufacturing. Mattoon’s downtown, centered around the Illinois Central railroad, has been largely supplanted by strip-malls which are oriented towards the highway. One family member commented on the economic shift from downtown Mattoon to the periphery: “I reflect on my memories of Mattoon and the vibrancy of downtown and the decline as activity migrated to the interstate.” (Learning Circle Meeting Notes 01/30/2013). According to the Learning Circle participants, the downtown economy is improving; several new restaurants are thriving, and the Mattoon YMCA recently opened a busy new facility. Unfortunately, the most visible sign of this improvement in the landscape is a proliferation of treeless parking lots. Aside from the overgrown railroad right-of-way, there are very few trees downtown; the overwhelming impression is of concrete.

The project site (Figure 2) is located in downtown Mattoon, next to Consolidated Communications and across the street from the Train Depot and newly-created arts center. Richard Lumpkin purchased the site and leveled its building in 2008, before the Great Recession scuttled hopes of a more lucrative redevelopment project. It is now half turf-grass and half-gravel parking lot. In 2012, the Foundation decided that the site has the potential to be of great public benefit. The site is proximal to some of the LFF’s most significant recent donations to the town. It is across Broadway St. from the Community Arts Center, located in the Train Depot, and across 17th St. from a new mural depicting some historic scenes of the town. The LFF hopes that creating a sustainable and relevant park will help rejuvenate downtown, and ideally draw people from beyond Mattoon.

Figure 3: Preliminary design by Design Perspectives
Learning Circle in Practice

The Learning Circle was designed to help the Lumpkin Family Foundation and other Mattoon stakeholders gain competence and confidence in approaching this sustainable design project. The Lumpkin Family Foundation initiated the Learning Circle after seeking, reviewing and then rejecting a design proposal from the landscape architecture firm Design Perspectives. Foundation members indicated that the Design Perspectives proposal lacked both practicality and relevance to the town. In addition, they identified their knowledge of sustainable design as a weak point in their ability to evaluate and support this project.

The Foundation sees value in the project, providing an attractive public space at the center of Mattoon that complements earlier investments in the Mattoon Arts Council. There may also be value in providing a leadership model in sustainable practices that goes beyond simple beautification. However, trustees and Members question the level of usefulness and value of the park, its fit with the plans of the City, the substantial cost, and whether a local entity has the ability to maintain the property in a satisfactory way. (“Terms of Reference,” Advisory Committee on the Broadway & 17th Street Park Project)

By engaging in this Learning Circle, the LFF sought to answer these questions, in reference to their vision of the site's potential.

Learning Circle members were a mix of Lumpkin Family Members, LFF trustees, local business leaders, and city officials. Most Lumpkin family members participated via teleconference; Richard Lumpkin and Tina Duncan were the most consistent and vocal family members. The LFF’s Director, Bruce Karmizan, and other staff and board members, also participated. Local stakeholders were included in the process from the beginning. Perhaps the most critical stakeholders were the city officials who participated. Because the LFF intended to hand control and maintenance of the park to the City of Mattoon, they needed City buy-in to move forward with the project. Three city officials joined the Learning Circle: Dean Barber, the City's Engineer, Justin Grady, of Parks and Arts, and Angelia Burgett, of Arts and Tourism. Mike Croy, facilities manager at Consolidated Communications, also provided a critical opinion, because of his buildings' close proximity to our site. Many participants were members of the Mattoon Arts Council in addition to their other roles. Professor Sullivan and I contributed our expertise on sustainable design issues.

We met approximately once a month during 2013. In the spring, we discussed a series
of readings on sustainable design, and established design priorities for the project. Over the summer and early fall, I developed and presented design options that we discussed in detail. In the fall, we settled on a final design, and I developed a cost estimate, and evaluated the process.

Readings & Discussion

In the spring of 2013, the Learning Circle discussed a series of readings about sustainable design. Professor Sullivan and I chose concise materials that would be useful to people with a wide range of expertise, tailored to inform the Learning Circle about the value and feasibility of sustainable design practices. Professor Sullivan provided a chapter on green space and human health. I selected the remaining readings on more technical aspects of sustainable design, including stormwater management, sustainable landscape materials, and small-scale energy production.

Figure 4: Strategies from "Sustainable Stormwater: A kit of parts Approach"
On March 6th, Professor Sullivan led a discussion on a chapter he wrote for Wellbeing and the Environment, titled “Wellbeing and green spaces in cities” (2014). The chapter discusses the psychological and physical health, and social benefits of exposure to green space. Participants were very interested in this topic. The LFF had already promised to donate 60 trees to the City of Mattoon, and the City was evolving plans to overhaul the downtown street-scape, including improving the urban canopy. In particular, we discussed the potential of increased canopy help people feel more sociable and create stronger community ties, and the potential of increased canopy to increase foot traffic and business viability. Professor Sullivan stressed that, while creating a lush park downtown would be beneficial, thinking about improvements on a neighborhood scale had the potential to accomplish much more. Angelia Burgett, Arts and Tourism director for the City, asked if we knew of any studies linking green-space to increased creativity (unfortunately, no). Learning Circle members seemed to find Sullivan's work on human health inspiring for the future landscape of Mattoon.

On April 3rd, Justin Grady, from the City Parks District, led our discussion on two readings about stormwater management: “Sustainable Stormwater: a kit of parts approach,” a document produced for the City of New Orleans, and “Using Porous Asphalt and CU-Structural Soil,” a resource on permeable paving by Cornell University. The discussion about these read-
ings was wide-ranging, and revealed a great deal about the sophistication of the Learning Circle members' ideas. While these ideas were new to most of the participants, some members had considerable knowledge about design, water, and tree plantings. Justin Grady and Dean Barber, city officials, and Tina Duncan, a family member, were able to answer most questions that other members had, such as the difference between a drain tile and a bioswale and the value of stormwater management. The readings also sparked discussion about the wider project goals. Do we incorporate sustainable stormwater practices to make the site function well in and of itself, or do we highlight certain strategies as a showcase to encourage other community members to adopt these practices? Learning Circle members thought that bioswales and permeable pavement were the right scope to fill both of these roles. These questions about the scope and audience of the project continued to be part of the discussion throughout this process.

On May 22nd, I lead a discussion on sustainable materials and small scale energy production, based on readings from the Sustainable Sites Initiative website, landscapesforlife.org, and Energy.gov. Participants were especially interested in recycled materials, and the possibility of salvaging elements from recently-leveled historic buildings. They also decided to focus on solar power, because small scale wind power involves an untenable amount of short- and long-term infrastructure expenses. This discussion was very abbreviated, because during this meeting we also talked about Design Perspective's concept, and the Learning Circle's priorities for the park as a whole.

Overall, participants were engaged in the discussions, which took information presented in the readings and brought it back to the specificity of Mattoon and the park site.

Design Phase

The Learning Circle began seriously discussing design priorities for the park in May, and continued the iterative design process into September. In May, we established design priorities based on our spring discussions, and I began producing design concepts for the group to consider. I presented three design concepts to the Learning Circle and members of the extended Lumpkin family in July. I took feedback from this discussion, and produced two more developed designs to the Learning Circle in September, where the members
chose their final design.

We spent most of the May 22nd meeting discussing Design Perspectives' concept for the park, its shortcomings, and what the Learning Circle actually wanted from the park. Having a negative example to discuss seemed to promote critical thought about their vision for the park, in a way that a good design might not have. Before the meeting, I generated a series of neutrally-worded questions to elicit the Learning Circle's opinions, starting with “What about this design did you like?” Bypassing my tactful approach, the group immediately launched into vociferous criticism.

The Learning Circle had critiques about both practical and aesthetic aspects of the design, but their biggest issue was with programming. There was a consensus that the site was overcrowded with “features” that did not create a unified whole. The gazebo, stage, bioswale, permeable pavement, solar panels and wind turbine all theoretically contributed to the park’s stated program, but because these elements seemed like they were assembled based on a checklist, the Learning Circle agreed, the whole project was uncompelling.

This lead naturally to a discussion of the Learning Circle’s programming priorities for the park. Our discussion centered around two main points: the relevance and appeal of the park to the residents of Mattoon, and the role of the park as a sustainable design showcase. Learning Circle participants wanted a space scaled appropriately for activities such as weekday concerts and lunches. There was some disagreement about the degree to which a dedicated stage would be used. They also wanted to make sure there was space for a farmer's market and other weekend activities.

The Learning Circle also agreed that they wanted to prioritize sustainable design practices that would be relevant to other sites around the community. In particular, they wanted a site that showcases economically viable green design strategies, which might persuade others to adopt them. They wanted appropriately scaled, useful stormwater management facilities, and appropriately scaled energy production. There was still interest in solar panels, but participants seemed very skeptical of the usefulness of including wind power on the site. Dean Barber, the City’s civil engineer, suggested that wind installations may not even be legal within city limits. The participants also thought that the design contained too few trees and too much parking, a surprising sentiment given that some of these people were responsible for several brand-new treeless parking lots in the neighborhood. We discussed the possibility of using parking lots with vegetated permeable pavement that would have a park-like feel and could
be used for both cars and recreation. I left the May 22nd meeting with the a list of functions and uses to guide my design process. Functions included stormwater management, 40% canopy cover, power production and floral resources to support bees. Uses included outdoor lunches, waiting train passengers, a farmers market, multifunctional parking, food carts and concerts.

Using parameters outlined in the May meeting, I generated three schematic designs for the park. From almost the beginning of the design process, I worked in a 3D modeling program, with the idea that 3D models would enable me to more easily generate compelling montages. Traditional plan view and section drawings can be difficult to understand for non-designers, and I hoped that producing montages would create a more persuasive set of designs.

I drew inspiration for the two of the initial designs from my research into Mattoon's railroad history. Mattoon's historic relationship to the railroad was clearly still a large part of the town's identity; all of the Lumpkin Family Foundation's contributions to Mattoon's downtown are connected to this history. A recent mural depicting the crossing is across the street to the east. Incorporating railroad references seemed like a good way to make the designs relevant to the town. In addition, the park site's proximity to the railroad and the Train Depot make a rail theme more appropriate. The first design, “Roundhouse,” was modeled after a circular structure used to repair locomotives. The second design, “Railroad Crossing,” recapitulated the historic rail crossing that created Mattoon. The third design, “Circles,” was purely abstract in its inspiration. All three designs included multifunctional parking areas with permeable pavers, gazebo/stage areas, bioswales and solar panels.

First Design Review

On July 12, 2013, we met in Mattoon with both the Learning Circle and about 20 members of the Lumpkin family. Professor Sullivan led a short tour of Mattoon's downtown, outlining environmental design problems and suggesting solutions. We then reviewed my three design schemes in the meeting room of a local coffee shop.

The printed design boards were laid on tables around the room, and participants circulated to look at the images and ask questions. I gave them surveys with questions about what they liked and did not like about each design, and I circulated to answer questions. We spent an hour discussing the designs as a group.

Responses to these designs were varied and thoughtful. Individuals responded to formal, programmatic and environmental elements in the park. Participants appreciated the idea of including of historical elements, and although many particularly liked the
July 12th Design Review

Figure 6: First Iteration Park Designs
“Roundhouse,” Richard Lumpkin thought it was too sophisticated for Mattoon. The rigid linearity of “Railroad Crossing” was unappealing to most participants. They almost universally wanted a more contemplative atmosphere, in opposition to the “plaza” style spaces I had envisioned. They thought that a fountain would be an important part of this. Dean Barber requested, as the man in charge of maintenance, that any fountains be designed to play in because people would do that anyway. Participants were also looking for a more clearly-defined performance space and more opportunities for arts programming generally.

Responses to the environmental-related aspects of the park once again surprised me. I included adequate multi-use parking on the site to accommodate the parking that the park would otherwise displace, partly because we discussed this possibility, and partly because previous land use in the town suggested that parking was untouchable. Both the out-of-town Lumpkin family members and the local Learning Circle stakeholders thought that I included far too much parking and paving. Mike Croy, the Consolidated Communications facilities manager, who had the greatest stake in retaining this parking, officially gave me the go-ahead to remove it. People generally liked the power production and the bio-swales with native flowers.

I learned about the future Community Arts Center at this meeting, and it was obvious that I needed to reorient my designs, currently focused towards the intersection of
Broadway and 17th, towards the train depot. This would connect the site physically and programatically towards both the Arts Center and the train infrastructure more generally.

Second Iterations

I took these new criteria and generated two further iterations in a greater detail. I continued to emphasize historical references, and included in each design a dedicated stage and fountain. I also increased the extent to which the design focused inward, provided opportunities for contemplation on the site, and reoriented the designs to focus on the Train Depot.

In the first design, I returned to the “Railroad Crossing” concept, but replaced the single rail crossing reference with the three original rail lines that framed Mattoon, using them as walking paths. In addition to quoting the town’s history, these paths improved circulation and connection to the Arts Center. They also created a central courtyard, the ideal place for a contemplative fountain. I chose a splash pad-style fountain, because they are noisy, are designed for play, and require very little water compared to conventional fountains. I modeled the stage on the facade of the Train Depot.

In the second, more abstract design I reinterpreted the earlier “Circles” design, reorienting it towards the Train Depot and replacing the plaza area with a mounded lawn and grove. I modeled a fountain on the three smokestacks of a steam locomotive, and the stage after a glass and steel train shelter.

I also focused on improving the visual style of my images. Because trees provide the sites’ most important visual and environmental improvements, I wanted to develop a 3D tree model capturing a lush canopy quality. I also improved my rendering style and generated many more perspective montages, to make a more compelling visual argument for the designs.

Second Presentation and Review

These designs were discussed with the Learning Circle on September 18th. This time, I presented the designs using a digital projector which allowed me to control the pace and sequence of the presentation. I presented the two designs in parallel, comparing each important feature (circulation, stage, fountain, sculpture garden, swales, etc). The participants were “energized and ready to give input,” and every single one of them had read my presentation before coming to the meeting.
Railroad Crossing

This design is based on the intersection of the three railroads that shaped Mattoon’s early history, the Illinois Central Railroad, the Indianapolis-St Louis Railroad and the Peoria-Decatur-Evansville Railroad. This scheme creates a series of meandering paths that shape circulation and create “outdoor rooms” that shape site uses and planting zones.

Mattoon Bird’s-eye Map, 1884

Park Site Context

View from

Looking from park entrance, through the sculpture garden towards the stage.

The stage is aligned with the train depot, and its design mimics the depot’s entrance.

Figure 8: Excerpt from second iteration, first design
July 18th Review, Design 2

Circles 2
This design imposes abstract shapes on the landscape to create a varied topography connected by circuitous pathways. Low ‘negative space’ is occupied by a fountain and swales, while uplands are occupied by meadows and trees.

Figure 9: Excerpt from second iteration, Second design

View from D
This fountain mimics a steam train’s smokestack. The shallow pool and zero-depth entrance make it ideal for wading.
Their responses to these designs were overwhelmingly positive; Learning Circle participants unanimously agreed that they wanted the “Railroad Crossing” design. Dean Barber, the City Engineer, commented how difficult it is to impose a design on a blank slate and complemented my design skills for generating this relevant and interesting design. They also requested that I take the steam engine fountain from the Circles design and put it in the Railroad Crossing design. This change meant that every formal element in the park was related to the railroad.

Tina Duncan raised the concern that invasive species from the unmanaged railroad right-of-way would very easily colonize any area in the park not regularly mowed. The right-of-way is thick with bush-honeysuckle and tree of heaven, along with equally aggressive native species such as box-elder. The participants also unanimously agreed that the park design cannot take away street parking. They agreed both that these spaces are needed downtown, and that removing street parking would scuttle public approval of the park. The only other change they requested was that the path through the south swale was unnecessary. We also discussed street lights, power use and power production. Would street lights interfere with the trees that line all the paths? Dean Barber indicated that he didn't think so, and specified that they wanted 12-15 foot dark sky lights.
Professor Sullivan and I asked about the possibility of presenting this work in a community meeting. All of the city officials felt that, because this project is privately funded, there was no need for this group to engage in a public process. LFF members were more supportive of the idea, but Richard Lumpkin wanted to get the cost estimate before presenting the work to a larger audience, to make sure that the project as presented was feasible.

The reception of “Railroad Crossing” was so positive that it required only slight cosmetic changes. The formal and programmatic elements that tied the design to local history and culture made it especially compelling to the Learning Circle. After making the proposed changes, I turned my attention to generating estimates of the cost and environmental benefits of this park.

Final Design, Cost Estimate & Critique

The final phase of the design process lasted from mid-September to early December. On October 16th, I presented the final design and cost estimates to the LFF. On November 23rd, I presented a comprehensive final document.

Based on the September meeting with the LFF, I made minor changes to the Railroad Crossing design, including: restoring the street parking on the north edge of the park, eliminating the southern path, including the steam locomotive-inspired fountain, and re-designing the planting plan to exclude invasive species encroachment. Instead of using shrubs in the design, I included perennial mixes that can be mown to the ground annually. This design limits the ability of invasive species to establish and out-compete the desired plants, while requiring a minimum input of either labor or herbicides. Taking these changes into account, I estimated the cost of the project.

Engaging the cost estimate and environmental analysis process became a comparatively tangible process for all members of the Learning Circle. We had been proceeding with certain assumptions about the costs and benefits of the project; this phase was a test of my intuitive understanding of the site processes, and the first time the participants could get a substantive sense of how feasible this project would be for their town and budget.

With the extensive help of Professor Jessica Henson, I generated a detailed cost esti-
Finalized Design

View looking south towards stage

View looking west towards fountain

Figure 10: Finalized design
mate of the park. I included costs of materials and labor, using the RS Means Sitework guide-
book (2012), and included allowances for the structures and fees for both the Landscape Ar-
chitecture and construction firms. I emphasized the places where it would be possible to use
recycled materials in an aesthetic way, to reduce both carbon footprint and cost.

I also quantified the amount of storm-water runoff the park could manage. The design
would be able to treat runoff from a hundred year storm, for both the park itself and the Con-
solidated Communications building roof and parking lot, as well as runoff from a 10-year storm
from the adjacent section of Broadway Street. To assess the value and feasibility of small scale
energy production, I calculated the amount of energy needed for the site, including lights and
the fountain, and estimated the number and cost of solar panels necessary to offset it. I also
compiled a list of subsidies, tax breaks and grants available for solar panels.

I presented this work to the Learning Circle on October 16th, 2013. I highlighted those
areas of construction in which the cost would be widely variable depending on the materials
and construction, and where the Foundation’s choices would have the most environmental
impact.

The participants had positive responses to most individual parts of the presentation,
and we were able to narrow down some options. Dean Barber had some specific corrections on
the cost of specific landscape materials through the City, particularly plant materials. Par-
ticipants were enthused about the site’s storm-water management potential. Bruce Karmizan
asked about potential problems with standing water in bioswales, and I told him that most
swales are designed to draw down completely within 48 hours to prevent mosquito problems.
The consensus about solar power was that it makes sense to run the fountain with solar, since
solar can easily produce enough power at the appropriate time of year, but that power to run
the street lights would not be practical given the low cost of energy in Mattoon and the area
of solar panels needed. I left the meeting with promises of more accurate cost estimates for
several plant-material and hardscape elements from Dean Barber.

I produced a final document for the Learning Circle, intended for their use as the
project goes forward and as a resource for related projects in the future. I also summarized
the evolution of the project, and touched on how specific elements of the design fulfill social,
environmental and economic sustainability goals, as well as providing an extensive list of additional resources on the topics we discussed. I evaluated all the environmental aspects of the site using the Sustainable Sites Initiative criteria, and determined that, depending on construction methods, our project could receive 2 or 3 out of 4 stars. I also presented a final the cost estimate.

I presented this final document on November 23rd, 2013. It was immediately clear that this was not quite the information members of the Learning Circle were looking for. Some LFF members wanted a more narrowed-down cost estimate (which I felt I was not equipped to provide). Mr. Karmizan and Mr. Lumpkin expressed concern about the high end of the cost estimate and range. I reiterated that, while the cost estimate contained a large amount of uncertainty, the estimates included a 25% contingency, and that the high end represented a “Cadillac” version with elaborate structures, while the low end still included the most important environmental benefits. We also discussed the possibilities of phasing in some more expensive built elements like the stage (the largest single cost) to make the project more feasible.

We discussed the future of the project, and several possibilities were discussed. One member suggested sponsoring a design competition (this idea was quickly shot down). Mr. Karmizan asked me if I would continue to work on the project; I demurred, telling him that I needed to ask my mentors what additional help it was appropriate for me to give at this phase. Mr. Barber pointed out that I had come to the limit of both my responsibility to them and of my expertise as a student, and that they needed to hire a professional landscape architect to complete the process. He mentioned that he has been working with WRD Environmental, a noted Chicago landscape design and engineering firm.

Bruce Karmizan indicated that he would present the project to the Lumpkin Family Foundation Board of Trustees in December, 2013. He asked me to produce a mission statement for the park, that he could give the Trustees.

The Mission Statement I developed reads:

The Broadway and 17th Park Project aims to create a multifunctional space which improves the environmental quality of Downtown Mattoon, while amplifying Mattoon’s unique sense of place. Sustainable design elements, such as its dense tree canopy, bioswales and native flower-
beds, serve to reduce the effects of stormwater and the urban heat island effect, while creating a soothing and beautiful gathering place to eat lunch or take a walk. The fusion of Arts programming and historical references link the park both to its surroundings and Mattoon’s cultural values. Site programming includes performance space and a sculpture garden, and a wading fountain, and the park could host festivals and outdoor markets. Finally, this park aims to make sustainable design practices accessible and appealing to visitors, and serve as a model for other projects in Mattoon and beyond.

At the time of this writing in March 2014, the LFF and the City of Mattoon were negotiating the terms of their partnership on this project, and no community meeting has been planned.
Evaluation of the Learning Circle

The final phase of this project involved evaluating the Learning Circle process. I wanted to understand the extent to which participation in a Learning Circle can build the competence and confidence of local stakeholders engaging in a sustainable design process. To address this question, I conducted a survey of Learning Circle participants. I asked questions about on their perceptions of the process and its outcomes. I also analyzed the comments they made in our discussions, and to the extent possible, their ongoing choices and priorities as the project proceeded.

### Education

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<tr>
<th>Question</th>
<th>Not at all</th>
<th>A little</th>
<th>Somewhat</th>
<th>A lot</th>
<th>Very much</th>
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<tbody>
<tr>
<td>Did you find the Sustainability readings to be informative?</td>
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<td>Was participating in the design valuable for you, over and above receiving the final design product?</td>
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<td>Did participating in this design process sharpen your understanding of sustainable design principles?</td>
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<td>Do think this type of process would be useful to other communities?</td>
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### Confidence and Competence

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<tr>
<th>Question</th>
<th>Not at all</th>
<th>A little</th>
<th>Somewhat</th>
<th>A lot</th>
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<tr>
<td>Do you intend to share these readings with others?</td>
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<td>Will you use ideas you learned through the design process in other settings?</td>
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<td>Are you more likely to consider sustainable design strategies in future projects you are involved in?</td>
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<td>Does sustainable design in general now seem more practical for Mattoon?</td>
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<td>Do you feel more knowledgeable about sustainable design than you did before participating in the Learning Circle?</td>
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Figure 11: Excerpt of survey responses. Survey answers suggested that participants found the educational aspect of this process especially valuable. They expressed somewhat higher levels of confidence and greater intention to incorporate these practices into other aspects of their lives.
Immediately after the final meeting, I emailed a questionnaire to the Learning Circle (via Google Forms). The questionnaire included a variety of queries regarding the experience of participating in the Learning Circle, their reactions to the reading and design possibilities, as well their comments on the process overall. In particular, they were asked to assess the value of various aspects, rate the improvement of their understand of sustainable design principles, and the likelihood that participation in this process would change their future choices in regards to sustainable design. Nine out of 13 individuals responded to the questionnaire. Responses were positive, especially in regards to the strictly educational aspects of the process.

The suite of questions that got the lowest scores, between “somewhat” and “a lot,” had to do with the effectiveness of this process in making participants more likely to enact some of the ideas that they learned about. These responses were still positive. They could indicate a lesser success in this part of the project, or reflect a previous commitment to sustainable design practices, which they were actively trying to enable by engaging in this process.

The open-ended questions elicited more specific insight into the participants’ mind-frames. Participants in general found the combination of readings and discussion with the Learning Circle to be especially useful. Both specific and open-ended questions suggest that this portion of the Learning Circle process was the most successful. Two participants wished I could have been more specific about the cost estimate, which made me think that I was inadequately clear about the way the content of the cost estimate was organized, and where the greatest amount of variability lay (i.e., the structures, which I am unqualified to make a detailed cost estimate of). Overall, these responses suggest that the project did increase the participant’s confidence and competence in understanding and discussing sustainable design concepts.

Analysis of the Learning Circle's discussions and decisions also point to increased competence and confidence. In retrospect, this project has had a clear trajectory. Participants moved from a commitment to the idea of sustainability, to prioritizing a design strategy grounded in social, economic, and environmental sustainability.

The initial site plan, by Design Perspectives, with its laundry list of “sustainable” fea-
tures, exemplifies the ungrounded idea of sustainability. When the LFF approached Professor Sullivan to engage in this process, they understood that an ungrounded vision was inadequate, and could articulate the project's shortcomings but not identify possible solutions. The Learning Circles' critiques of Design Perspectives' scheme homed in on two issues that can be interpreted as “economic” and “social” sustainability. First, the Foundation thought that the cost to develop the Design Perspective's plan was unreasonably high. Second, none of the stakeholders thought that the Design Perspective design had any relevance or utility for the town, and doubted that it would create a public space that would attract people downtown. These criticisms made it clear that we should guide the Learning Circle to engage in ideas concerning economic and social sustainability as well as the more obvious environmental issues we would consider. By the project's close, the Learning Circle's engagement with sustainable design ideas was critical and specific. Our conversations focused on exemplifying environmental and social solutions that could be attainable and meaningful to Mattoon's residents. This transition from single- to triple-bottom line principles happened organically through our discussion of the needs and values of Mattoon and the Lumpkin Foundation.

Social sustainability was a focus of our conversations throughout our Learning Circle process. Participants were enthusiastic to learn about the psychological value of green space, and particularly concerned that the design create a contemplative atmosphere. Our discussions also dwelled on the importance of Mattoon's cultural history, especially in regards to its rail connection. Learning Circle members were uniformly enthusiastic about the numerous rail-related elements I incorporated into the final design. In the eyes of the stakeholders, at least, inclusion of references to this cultural history significantly increases the relevance of the park to the community. If these design elements stimulate high levels of use in the space, then our assessment will certainly be accurate. Overall, we spent more time discussing concerns related to social sustainability than either environmental or economic sustainability. This may reflect the park's ultimate purpose as the social focus of Mattoon's reviving town center.

Desire for economic sustainability also manifested throughout the process, though less obviously. Participants expressed the need for “green” elements to be economically sustainable. Dean Barber was worried that if expensive elements such as a wind turbine were included
in the design, the City would be unable to afford the maintenance of such a structure, or the site, in the long run. More generally, they wanted to showcase green design elements that would be both accessible and economically advantageous for other community members to apply to their own landscapes. One strategy that seemed especially attractive was the use of recycled concrete pavers, which is both inexpensive and can achieve a wide range of visual effects. The projects’ ultimate cost remained a major concern for the LFF as of the Learning Circle's completion.

The Learning Circle remained enthusiastic about the possibilities for environmental sustainability, and engaged Professor Sullivan and me in thoughtful discussion of the opportunities and hazards inherent in the strategies we suggested. Consolidated Communications was unexpectedly willing to give up 38 parking places to green space. They were also receptive to the possibility that the design use bioswales and permeable paving on a portion of the site that they would continue to own and control. They proved less committed to providing sustainable power production, due to both economic and space requirements, ending with the narrow intention to power the fountain pump with solar. Power in Mattoon is particularly inexpensive, which probably effected their decisions in this regard. Overall, they responded well to environmental design strategies that were couched in terms of resource conservation such as materials and water recycling or LED lights, and in terms of local quality of life, such as reducing the heat island effect and flooding, and increasing the psychological wellbeing of the community through greenspace.

Advantages of the Learning Circle Method

The Learning Circle process had many advantages. One unexpected effect of the roundtable style discussion was that it highlighted the existing expertise and enthusiasms of participants within the community. In particular, the Learning Circle gave a context for City officials Dean Barber and Justin Grady to share their expertise on sustainable design topics. The depth of their expertise was a surprise to some within the Learning Circle. Barber and Grady were able to endorse familiar ideas, and understand and articulate the new ideas our readings brought to the group in a persuasive way. Keith Summers brought an existing enthusiasm for historical materials salvage and recycling, and Tina Duncan contributed her advocacy
for native plants and biotic diversity. It is my impression that the Learning Circle provided a unique forum to bring together these sustainability-related voices, making the whole project seem more feasible and relevant to Mattoon. As experts, Professor Sullivan and I were able to broaden the discussion and provide context and quantification, but we were not working from scratch.

The biggest shortcoming of this Learning Circle was the narrow demographics of the participants. City officials, influential business-owners and Foundation members were represented, and including only people with a specific stake in the construction of the park makes some sense. However, middle-aged and older white men dominated the group. More age, gender, class and racial diversity would have brought a broader perspective to the table. In particular, including younger people in the process would have been beneficial. What if this group’s enthusiasm for train history does not seem relevant to their children and grandchildren? What elements would young adults find most compelling in a new park? The representation of a broader demographic would also have mitigated some nascent classist overtones in some of our discussions. One LFF Trustee, in particular was worried about the park being used by homeless people; his concerns were rebuffed by other members who disagreed that it would be a problem, but the underlying assumption that homeless people should be excluded went unquestioned. A broader group of stakeholders would have been better able to assess the long-term social sustainability of the park.

The Learning Circle process has great potential to be applicable in other communities. In the closing survey, Learning Circle participants nearly unanimously said that the readings and discussion were the most useful part of the process for them. This is a useful finding, because this phase of the Learning Circle has the greatest potential to be replicated in other contexts. The Lumpkin Foundation and its support for this park provide Mattoon with a unique resource, but every town has a mix of city officials and engaged citizens, who might shape their communities' design priorities. Experts might be a more limiting factor, but local universities or community colleges could participate. A Learning Circle could be initiated in almost any town, with minimal cost and time committed.

This project demonstrates that the learning circle has great potential for enabling meaningful stakeholder participation. What is less clear is how to bring sustainability-
themed learning circles to other communities. Mattoon has a great resource in the Lumpkin Family Foundation, which was able to precipitate interest in sustainable design by offering the community resources, and inviting stakeholders to participate. The LFF is also extensively connected with urban professional networks and environmental nonprofits, resources that other small towns may lack. The fact that our Learning Circle was initiated by local stakeholders was critical to its success. The next challenge is eliciting local interest in towns that may not have this kind of opportunity. The LFF itself expressed interest in leveraging this experience as a resource for other communities. Whether they pursue this opportunity, and what form such a resource would take, is yet to be seen.
Conclusion

The Lumpkin Family Foundation Learning Circle was an effective means of building the competence and confidence of participants to engage in a design process that produced a model sustainable public park in downtown Mattoon. After participating in the Learning Circle, individuals not only reported an improved understanding of sustainable design principles, but also demonstrated an improved understanding.

The learning circle strategy allowed stakeholders to bring their specific expertise and curiosity to the topics at hand. This had a two-directional effect. First, hearing the knowledge of their peers seemed to help the members think of sustainable design practices as relevant to and attainable in Mattoon. Second, these extended discussions gave me, as the designer of the site, a nuanced appreciation for their values and needs, which I was able to incorporate into the design solutions. Most participants found the reading and discussion portion of the Learning Circle to be the most helpful activity that we engaged in together.

The iterative design process provided an opportunity to illustrate sustainable design practices in the context of downtown Mattoon. It especially made it possible to show that the environmental elements of the design, such as bioswales and recycled paving, could be aesthetically pleasing as well as functional. The design iterations also provided the participants with the opportunity to shape the design's program over time, as their ideas matured. Their specific input on the design's arts programing and historical connection was probably the biggest contributor to the design's success. Over the course of the project, the participants demonstrated an intuitive grasp of the concept of the “triple bottom line:” economic, social and environmental sustainability.

In addition to being a venue for our stakeholders to learn about sustainable design principles from Professor Sullivan and me, the Learning Circle provided a platform for our stakeholders to offer substantive ideas and criticisms during the design process. The participants expressed a sense of ownership of and investment in the final design that suggests they gained confidence in their competence as sustainable design critics.
Bibliography


——. 2013. “Meeting Notes Advisory Committee on 17th and Broadway/ LFF Learning Circle on Sustainable Community Development”. Lumpkin Family Foundation.


