Plantings with people in mind: Increasing use in urban vacant lots through planting design

by

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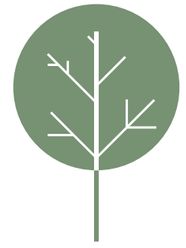
Abstract

Research has shown that frequent contact with nature is beneficial quality of life. Ironically, heavily populated urban environments push nature out of people's lives yet have many overgrown, poorly perceived vacant lots. This study focuses on how the strategic application of planting design principles in vacant lots can increase use patterns. Study of preferences is based on Rachel and Stephen Kaplan's Preference Matrix which is used to categorize various planting design principles according to how they affect preference.

The study site in northeast Kansas City, Missouri consists of two high-vacancy neighborhoods — Lykins and Sheffield. Residents in these neighborhoods were randomly sampled (n=26) to participate in semi-structured interviews that revealed preferences in planting design. Photographs taken on site were edited using Adobe Photoshop to create scenes that emulate each of the four preference categories. Interview questions asked participants to describe in detail what elements in the photographs are preferable and which are not. These qualitative descriptions were analyzed to reveal what planting design principles were preferred most often. Analysis revealed the most preferred planting design principles and why people preferred them. Analysis also provided clear direction on what category of the Kaplan's preference matrix is most important to encourage use.

Design guidelines were created to inform conceptual vacant lot designs. Subsequent designs were created to showcase preferred planting design principles. Local input improves the quality of outdoor spaces in high vacancy residential areas which can increase how often the designs are used. Planting designs based on community feedback present a simple and elegant solution to some of the problems plaguing high vacancy urban neighborhoods in Kansas City, Missouri.

Plantings with People in Mind



Increasing use in urban vacant lots through planting design

Spencer Sanders
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Acknowledgments

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My biggest thanks goes to Kevin Hardy who started me on this path seven years ago. Thank you for taking me under your wing and treating me like family. You instilled in me a love for horticulture and design that I did not know I had.

Dedication

This report is dedicated to my amazing wife Makaal.
Thank you for tirelessly supporting me.

Overview

Introduction

Daily contact with nature is important to mental, physical, social, and emotional health (Amano et al. 2018; Anderson et al. 2017; Clancy and Ryan 2015; Conniff and Craig 2016; Grinde et al. 2009; Heroux et al. 2016; Maller et al. 2009; Whyte 1980). Urban environments lack contact with nature as more land is being developed and 'natural areas' are being consolidated to city parks and other designated areas. Additionally, many cities are experiencing problems with high vacancy which leads to untended open spaces that are negatively perceived. Human biophilic needs are no longer being met as nature is pushed further from human contact.

Existing literature demonstrates that green spaces can encourage people to stay longer outside, socialize more frequently, and be in contact with nature (Anderson et al. 2017; Marcus and Francis 1990; Whyte 1980). However, simply creating planted spaces does not ensure they will be used (Coley et al. 1997). High quality planting design has the potential to increase social use (Beatley 2009; Gochman 2016).

Additionally, many outdoor green spaces are created with little input from the surrounding community. This communication breakdown can lead to the creation of outdoor green spaces that do not meet local people's needs and preferences. Residents can be included in the design process to ensure that their preferences are used to design nearby outdoor spaces. This project uses local input to improve the quality of outdoor spaces in high-vacancy residential areas, specifically focusing on planting design.

Importance of the Project

Small-scale solutions like planting design are capable of being implemented by the residents, not a large contractor, which can foster a sense of community investment. Landscape architecture projects typically incorporate input from owners/stakeholders, but this input rarely addresses planting design. Building projects based on local planting design preferences could create new green spaces that residents will want to use and with which they can have a sense of pride and ownership. Residents can be trained and instructed on how to install and maintain plantings, which are relatively inexpensive when compared to other built projects. Vacant lots offer opportunities to use planting design to create preferable and enjoyable outdoor conditions that residents can use to socialize, be in contact with nature, and live healthier lives.

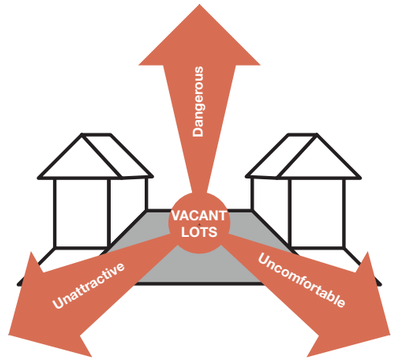


Figure 1.1 - Vacant Lot Dilemma

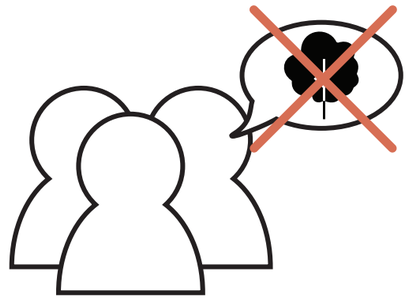


Figure 1.2 - Community Engagement Dilemma

Project Dilemma and Research Questions

Project Dilemma Overview

The existing body of literature clearly explains why nature is beneficial, but not enough attention has been paid to how quality planting designs should be formed to promote more use of outdoor space. First, the primary problem is how people avoid vacant areas due to negative stigma from their overgrown, unappealing physical features (Figure 1.1). Many vacant lots are uncared for and have uncontrolled vegetation. Changing the appearance of the vegetation and how it is designed could drastically alter the way people perceive vacant lots. Second, the traditional approach to design with community engagement often overlooks local preferences related to planting design (Figure 1.2). Disinvested communities would benefit from a bottom-down approach: residents inform design decisions and work with designers to create solutions to real needs and preferences.

Research Questions

This research intends to answer the following questions based on previously mentioned dilemmas: What planting design techniques and combinations are most preferred by residents in the Lykins and Sheffield area? And which planting design techniques would encourage social use of vacant lots in the Lykins and Sheffield area?

Project Goals

Answers to the research questions will help the researcher develop workable solutions on how vacancy in the study area could be addressed. The study area has multiple issues, including high vacancy, low incomes, low education, high crime rates. Solutions to some of these problems could be associated with changing the physical characteristics of the area. Using research-based planting design has the potential to positively affect use patterns encouraging more residents to spend time outside. In addition to health benefits (S. Kaplan 1995; Ulrich et al. 1991; Home, Bauer, and Hunziker

2010; Coley, Sullivan, and Kuo 1997) neighborhoods could experience a decrease in crime rates as more people spend time outdoors and keep watch over their area (Jacobs 1961; Montgomery 2013).

Planting design is not a foolproof way of solving community issues. However, planting design is a simple and inexpensive method to improve green space as well as being easily implemented. Residents would need to be trained on how to implement and maintain such spaces. People who implement preference-based planting designs would need to understand that the spaces are only positive influences on local conditions if they are well-maintained. The end goal of this research is to create implementable planting design plans for neighborhood residents in the study area that are addressing their needs and preferences (Figure 1.3).

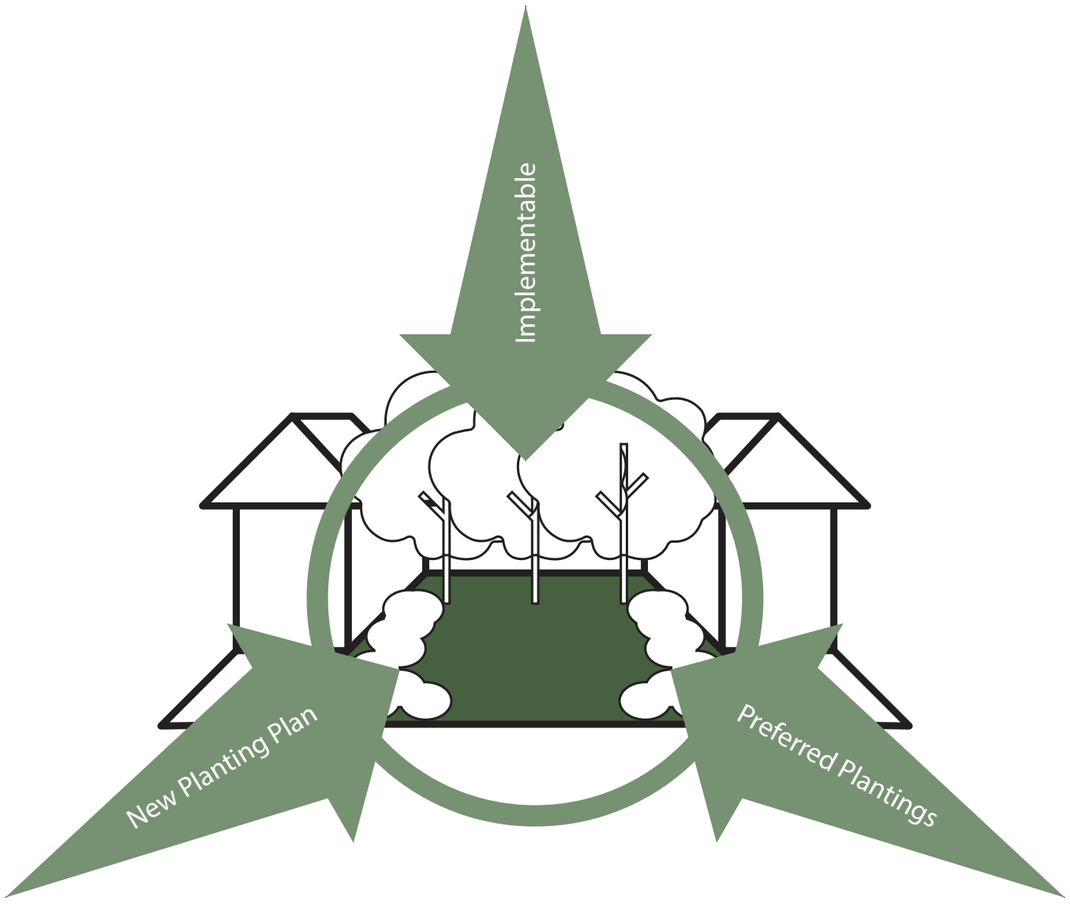
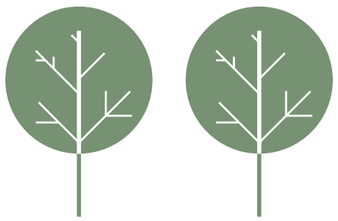
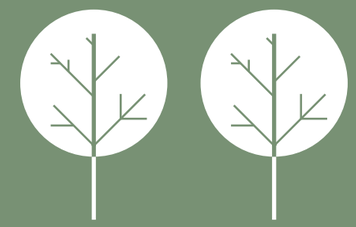


Figure 1.3 - Goals for Vacant Lots





Background

Literature Review

Overview

The following literature review focuses on how planting design can encourage use in vacant outdoor urban spaces. Many people in urban areas today spend little time outdoors. Many factors contribute to this issue including weather, temperature, seasons, preference, busy schedules, comfort, and lack of appropriate outdoor spaces. Landscape architects have little control over some of those factors, however there are many tools at their disposal that can influence people to use spaces despite outside factors. Planting design is often underrated as a design tool, but can have a meaningful effect on how people perceive and use outdoor space. Quality planting design can encourage people to use outdoor spaces by creating comfortable spaces that are visually interesting.

Human beings are social creatures and need to interact with others (Coley, Sullivan, and Kuo 1997). Spaces that are not designed with people in mind will not be used to their full potential (R. Kaplan, Kaplan, and Ryan 1998). People are instinctively attracted to nature, also known as biophilia (Beatley 2009). Studies show that planted areas encourage people to gather and socialize (Grinde et al. 2009; Sullivan, Kuo, and Depooter 2004). In this regard, planting design can be an effective tool in meeting human needs and preferences by creating enjoyable spaces that draw people outside and capitalize on biophilic response, which could result in a healthier community.

Human Needs & Preferences

People have very consistent preferences for landscapes, particularly natural landscapes (Home, Bauer, and Hunziker 2010). It is important to note that preferences are based primarily on two things: evolutionary psychology and place attachment. Evolutionary psychology is instinctual information processing that human beings subconsciously do in their environment. This instinct allows for innate understanding of landscapes that are safe or dangerous.

Place attachment is the phenomenon of emotional connection people develop with “a meaningful location” (Jeffrey S. Smith editor 2018). Place attachment varies from each person and

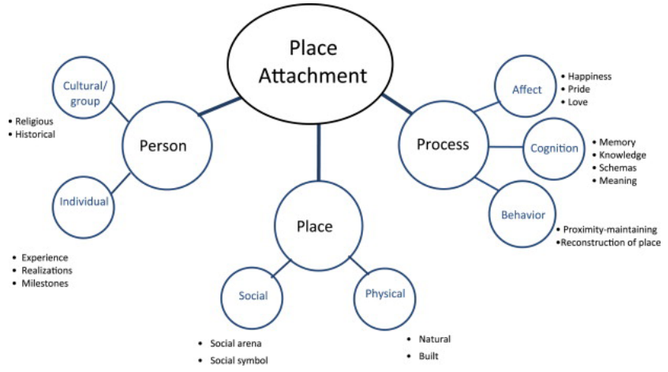


Figure 2.1 - A tripartite model of place attachment (Scannell and Gifford 2010)

Preference Matrix		
	Understanding	**Exploration**
2-D	Coherence	Complexity
3-D	Legibility	Mystery

Table 2.1 - Kaplans' Preference Matrix (Kaplan & Kaplan 1982)

across cultural groups (Scannell and Gifford 2010). Researchers Virden and Walker (1999) found that race and gender affected landscape perception and preferences. This may be from common experiences, historical events, and religion (Virden and Walker 1999). Scannell and Gifford (2010) created a tripartite model of place attachment that includes the many factors that affect it (Figure 2.1). This model reveals that there are many factors that affect place attachment and therefore, personal preferences for outdoor spaces. This report focuses on a more overarching approach to preference based on evolutionary psychology. Therefore, demographic backgrounds and cultural differences, in terms of environmental preferences, are not the focus of this study, although the body of literature in cultural geography suggests strong associations between demographic backgrounds and preferences (Scannell and Gifford 2010; Virden and Walker 1999). Ethnic groups or cultures may become attached to places because they practice and preserve their cultures (Scannell and Gifford 2010). Preferences, both positive and negative, can result from shared “historical events, religion, and other experiences common to group members” which can be transferred to later generations (Virden and Walker 1999).

These evolutionary preferences are based on two major informational needs of understanding and exploration (R. Kaplan, Kaplan, and Ryan 1998). Based on these two principles Stephen and Rachel Kaplan (1982) proposed a preference framework with four categories of psychological needs related to environmental perception: **coherence, legibility, complexity**, and **mystery** (Table 2.1). **Coherence** and **complexity** are perceived in two

dimensions. Rough number, grouping, and placement of plants are immediately perceived without moving through the space. **Legibility** and **mystery** require spatial understanding and placing oneself in a scene. Imagining oneself in a scene involves (three-dimensional) perspective. It would be useful to understand how the preference framework could be applied in the process of planting design to assist designers in creating user-oriented methods and approaches.

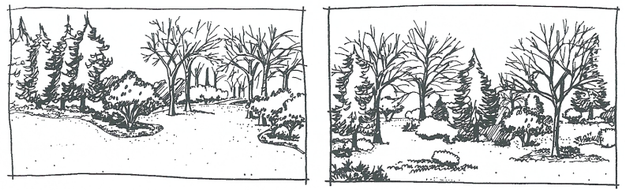


Figure 2.2 - The left scene is highly coherent and the right is not coherent (Kaplan, Kaplan, and Ryan 1998)

Coherence describes settings that are organized and can be easily understood (Figure 2.2). Scenes that are easy to understand are not necessarily boring but can have a complex variety of elements. However, **complexity** does not mean confusion, but encourages exploration and interest (Figure 2.3). **Legibility** in natural scenes creates distinctiveness, helps with wayfinding, and orients a person in the environment (Figure 2.4). Elements that help legibility could be a landmark or patterns in the landscape (Figure 2.5). **Mystery** is the desire to explore a place and compellingly interesting (Figure 2.6). These principles contribute to how a space is experienced by visitors. Well-designed landscape scenes are carefully constructed using all four of the preference matrix categories. Elements of planting design could be categorized to better understand how they influence preference.

Figure 2.3 - Highly coherent and complex (Kaplan, Kaplan, and Ryan 1998)

Natural areas are often preferred because of their ability to involuntarily capture the attention of human beings, yet are complex enough to be interesting (R. Kaplan and Kaplan 1978). Effective green space must be able to meet these preferences for people to be encouraged to use it. A strong

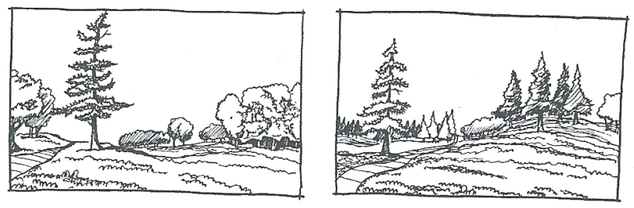


Figure 2.4 - A single tree is distinct and legible, but too much repetition causes a loss of distinctiveness (Kaplan, Kaplan, and Ryan 1998)

Figure 2.5 - Patterns aid legibility (Kaplan, Kaplan, and Ryan 1998)

Figure 2.6 - Mystery encourages exploration (Kaplan, Kaplan, and Ryan 1998)

understanding of people's preferences will mitigate fears of using public green spaces by allowing a designer to create familiar environments that are comfortably occupied.

Familiarity reduces uncertainty or of being unsure of what happens next. An environment that is illegible and too mysterious could deter people from use. This type of preventative uncertainty is a contributing factor to low vacant lot use and negative perception.

Natural environments should display a degree of management or design in order to give people an indication that a space is intended to be used and occupied (Nassauer 1995). Without such cues it may be unclear to visitors whether it is appropriate to use a space. This kind of ambiguity in spaces is detrimental to their overall effect on meeting people's preferences and needs. However, a landscape needs to be balanced between being naturally complex and clearly defined for human occupation. Designed spaces should be open enough to create a coherent and legible scene but offer enough mystery and complexity to be engaging. Human beings are very sensitive to spatial configuration and spaces that are spatially uncomfortable will not be used or preferred (Hall 1990). The fewer barriers there are to green open space, whether perceived or real, the more satisfied people will be with their neighborhood, greens spaces, amount of open space, and social opportunities (Hadavi and Kaplan 2016).

Shaping Space with Planting Design

While natural environments can

help people function healthily and foster well-being many urban nature settings fail to support people's needs and preferences. Not only is this important to creating good places that have restorative effects on health, but also appeal to the people who occupy them (R. Kaplan, Kaplan, and Ryan 1998). Appealing spaces create comfortable environments for people to occupy and gather in. Spatial definition plays a significant role in how such spaces are used and occupied (Golicnik and Thompson 2010). People unconsciously conform to certain uses and activities in public space when those spaces are articulated by planting design or other built elements (Hall 1990). Large spaces that are uninterrupted by plantings or built elements will allow large groups and more active uses. If there are more plantings and more subdivided spaces, then people may use the space for more passive purposes (Golicnik and Thompson 2010) (Figure 2.7).

Planting design principles are used in landscapes to help shape spaces and guide people through them. Planting design principles are listed in a multitude of sources however, few sources have examined them through the lens of people's preferences. This research will use those found in Professional Planting Design by Scott Scarfone (2007). The principles list are rhythm, unity, balance, texture, variety, density, contrast, color, scale and proportion, visual weight, emphasis, layers, visual connection, and degrees of enclosure (Scarfone 2007). These planting design principles could be studied to understand how they are associated with human preferences. This association of preference and planting design could help designers better understand how planting design principles can affect human perception and encourage use (Figure 2.8).

Not only does the amount of space available determine activities, but how the space is shaped plays an important role. Spatial principles of proximity/location, transition/change, and direction/continuity stimulate human engagement, interest and health (Thwaites, Helleur, and Simkins 2005). Plant forms can imitate architectural forms of planes, ceilings, and floors they can shape outdoor spaces to provide various forms of comfort and aesthetic richness.

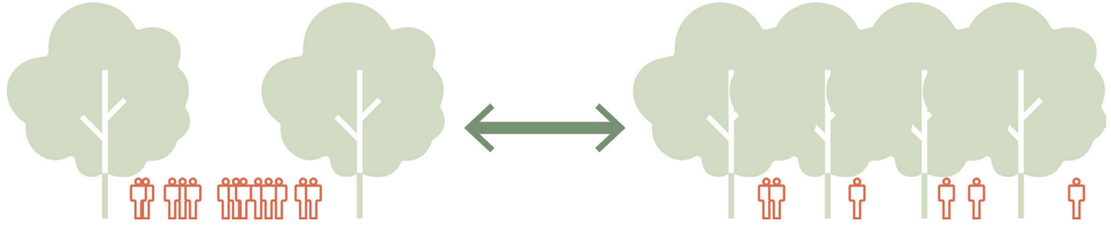


Figure 2.7 - Spatial configuration determines uses

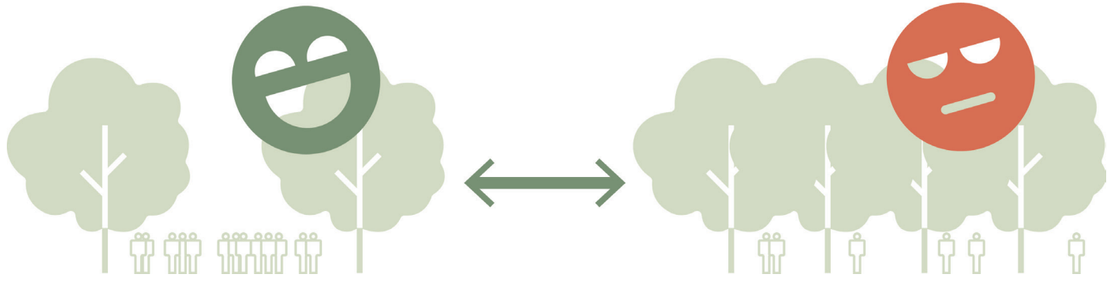


Figure 2.8 - Planting design preferences can also determines uses

Figure 2.9 - Signs of neglect in a vacant lot (Weinberg 2019)

Vacancy

Vacancy is a problem many cities in the United States are facing. Vacant areas are different than empty spaces. Vacant spaces have evidence of past human use or occupation often in some form of neglect (Corbin 2003). Often the presence of vacant land is associated with high levels of crime and other urban problems (Foo et al. 2014). While illegal activity does occur on vacant land, it is not always the case. A more significant finding is that the perception of disorder and uncertainty in an area increases the perceived risk of crime (Nassauer and Raskin 2014). People will perceive a vacant landscape as dangerous regardless of the actual criminal activity happening there. Negative perception of outdoor spaces will prevent nearby residents form using it, hindering positive biophilic benefits (Foo et al. 2014). As seen in Figure 2.9, unused, vacant areas may in time begin to look like nature, but the legacy of abandonment remains and will emanate a sense of neglect (Nassauer and Raskin 2014).

Neglected, vacant sites can be detrimental to cities, but are also an opportunity for community development and growth. Vacant land can convey untapped potential for a community (Corbin 2003). Many municipal governments are often primarily focused on attracting private investment and permanent solutions for development of vacant lots (Pearsall and Lucas 2014). This type of vision may overlook community-based opportunities to increase local spaces and infrastructure.

A primary way to combat problems with vacancy is to look for ways to increase social capital in areas that are highly vacant (Nassauer and Raskin 2014). Social capital is the value of support that people provide for each other, which has an effect on “maintenance, perceptions of safety, and crime in highly vacant neighborhoods” (Nassauer and Raskin 2014). To increase social capital, people need to have a stronger desire to go out and socialize with those in their community. Improvement to the visual quality of vacant areas can improve perception and increase use (Nassauer and Raskin 2014). Practices intended to beautify landscapes or secure boundaries signify the presence of people in the area that care about their neighborhood. Figure 2.10 and 2.11 illustrate how cues of care could discourage illegal activity and improve the perception of safety (Nassauer 1995). Some residents take care of adjacent vacant lots, which is known as blotting. Residents that are blotting can help improve the

Figure 2.10 - Vacant lot with few cues of care

Figure 2.11 - Vacant lot designed and planted to attract people and to improve cues to care

visual quality of their neighborhoods even though those vacant lots are not legally theirs.

Community involvement in vacant land improvements gives those living nearby a degree of local control and ownership (Pearsall and Lucas 2014). Every parcel of vacant land is unique and requires unique treatment, not a one size fits all approach (Pearsall and Lucas 2014). A variety of uses and improvements should be applied to vacant areas. Small-scale improvements have the potential to become a unifying network when applied across a larger geographical area (Corbin 2003). Vacant land is multi-functional – it can be used for more than just one purpose (Foo et al. 2014). Before assigning solutions, community leaders and residents should discover what needs are not being met in the area and if local vacant areas could be reimagined to meet those needs (Corbin 2003).

A diverse range of design solutions could be applied to vacant lots. Context and community involvement are key to understand which applications are appropriate and effective for a given area. Lots can be proscribed uses by neighborhoods, environmental factors, social-economic factors, or cultural processes (Kim, Miller, and Nowak 2018; Lokman 2017). Detailed examination of neighborhood dynamics will help develop meaningful interventions (Foo et al. 2014). Interaction with residents should produce typologies of reuse that can inform design decisions and create a cohesive network of interventions. These typologies could be the springboard for residents to begin revitalizing their neighborhoods. Public involvement will help reconfigure the perceived value of vacant lots economically, socially, and ecologically (Teixeira 2015).

Vacant lots in urban environments present a unique opportunity to experiment and conduct research to better understand how to encourage use through planting design. These lots are already infrequently used and have negative stigmas and perceptions that prevent use as well. Northeast Kansas City faces problems of vacancy that could potentially be solved through strategic applications of planting design principles that would encourage people to use vacant lots and reinvest in them. This study area presents an opportunity to further expand the Kaplan's preference matrix and receive feedback on what categories of planting design principles best meet people's needs in urban environments.

Planting Preference Matrix			
Coherence	**Legibility**	**Complexity**	**Mystery**
Unity	Visual Weight	Variety	Visual Connection
Rhythm	Proportion & Scale	Contrast	Degrees of Enclosure
Balance	Color	Texture	Degrees of Enclosure
		Density	Layers

Table 2.2 - Planting design principles are assigned to Preference Matrix categories to reveal how they effect preferences

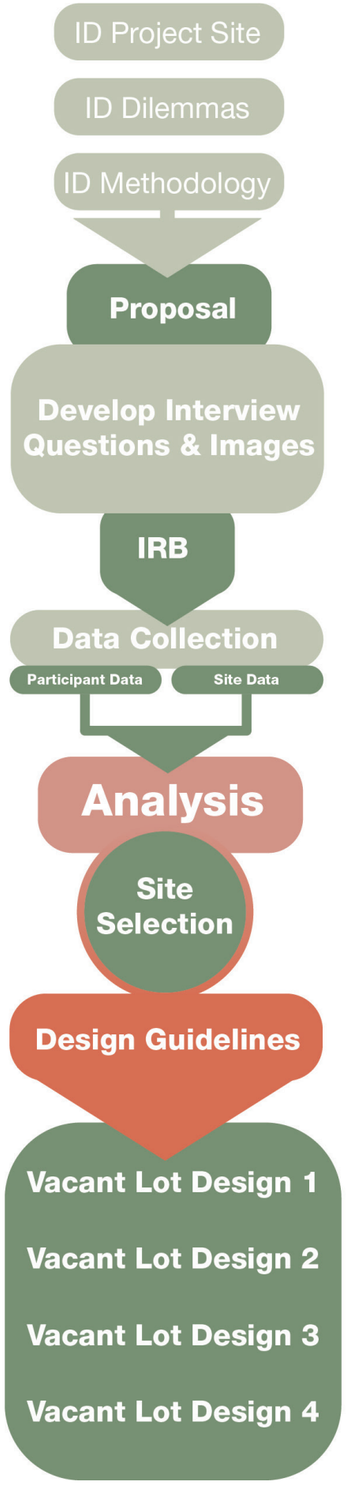


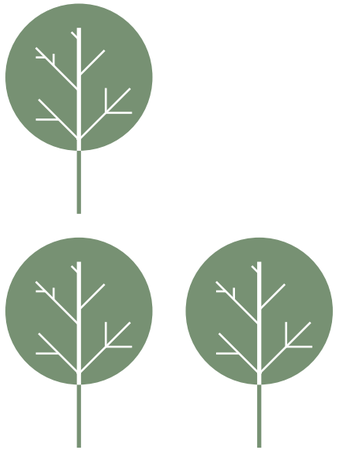
Figure 2.12 - Project process

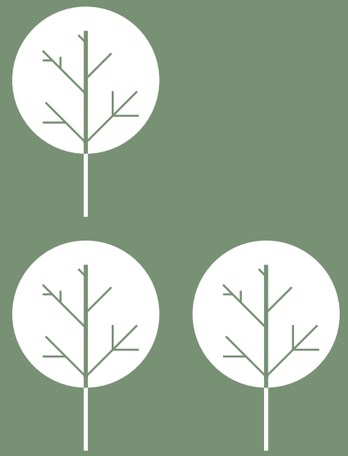
Project Rationale

The most vital aspect of this study is neighborhood resident preferences and opinions. Therefore, local participation in the study is needed to get residents' input and apply it into relevant design proposals. Without local preferences the designs would hold little personal value to the residents. Inclusion in the design process will link local ideas into professional designs.

To better understand how planting design can affect preference, common planting design principles were categorized into the four preference categories suggested by Kaplan and Kaplan (1982) (Table 2.2). These planting design principles do not always fit perfectly in one single category, but this matrix was developed to show the best fit in this research context. There are other planting design principles that may not be listed in this matrix, but careful consideration was given to what principles should be included to best understand preference as it relates to urban vacancy.
The listed planting design principles seem to be the most suitable to encourage preference and use. Analysis revealed participant preferences for certain spatial configurations, environments, and planting design principles. Participant preference will have a direct influence on which planting design techniques are used and focused on.

Preferences were captured through feedback from images presented to residents during interviews. Local knowledge was analyzed to synthesize general preferences of green space design. Combining local preferences with existing vacant lot conditions and attributes informed the creation of a typology of vacant lot reuses. Examples of some of these reuses were further developed into site designs based on analyzed data of preferences (Figure 2.12)





Research Strategy

Overview

The study area in Kansas City, Missouri consists of two neighborhoods with significant vacancy rates. Lykins and Sheffield neighborhoods are on the northeast side of Kansas City and face serious issues of high vacancy, crime, and lack of well-designed green space. (Figure 3.1). Because of these issues the neighborhoods in northeast Kansas City, Missouri are steadily declining. The City of Kansas City, Missouri has large-scale policies that attempt to treat and improve vacant lots. However, these solutions mostly seek to sell vacant land or clean it up. Selling and cleaning vacant lots is a good first step, but no policies seek the feedback and opinions of residents on how lots should be used or create site specific solutions. The Heartland Conservation Alliance (HCA) has a vacant lot restoration initiative with templates of potential design solutions. This approach redevelops vacant lots into more attractive spaces, but still does not base designs based on local feedback. Design solutions are frequently broad categories without site specific small-scale solutions based on local preferences. This study area is unique because there are opportunities to incorporate small-scale solutions based on local resident's needs and preferences.

A qualitative approach was created to identify and create design solutions for vacant lots in the Lykins and Sheffield neighborhoods of Kansas City, Missouri. Research data about vacancy and preference was collected from two primary sources: the site and the residents. Site data and interview data work together to answer the research question: What planting design techniques and combinations are most preferred by residents in the Lykins and Sheffield area and would encourage social use of vacant lots?

Site data and analysis revealed where design solutions were needed and what would be appropriate to apply. Interview data and analysis based on resident responses provides local insights on how design solutions should be implemented to create meaningful places to those that use them.

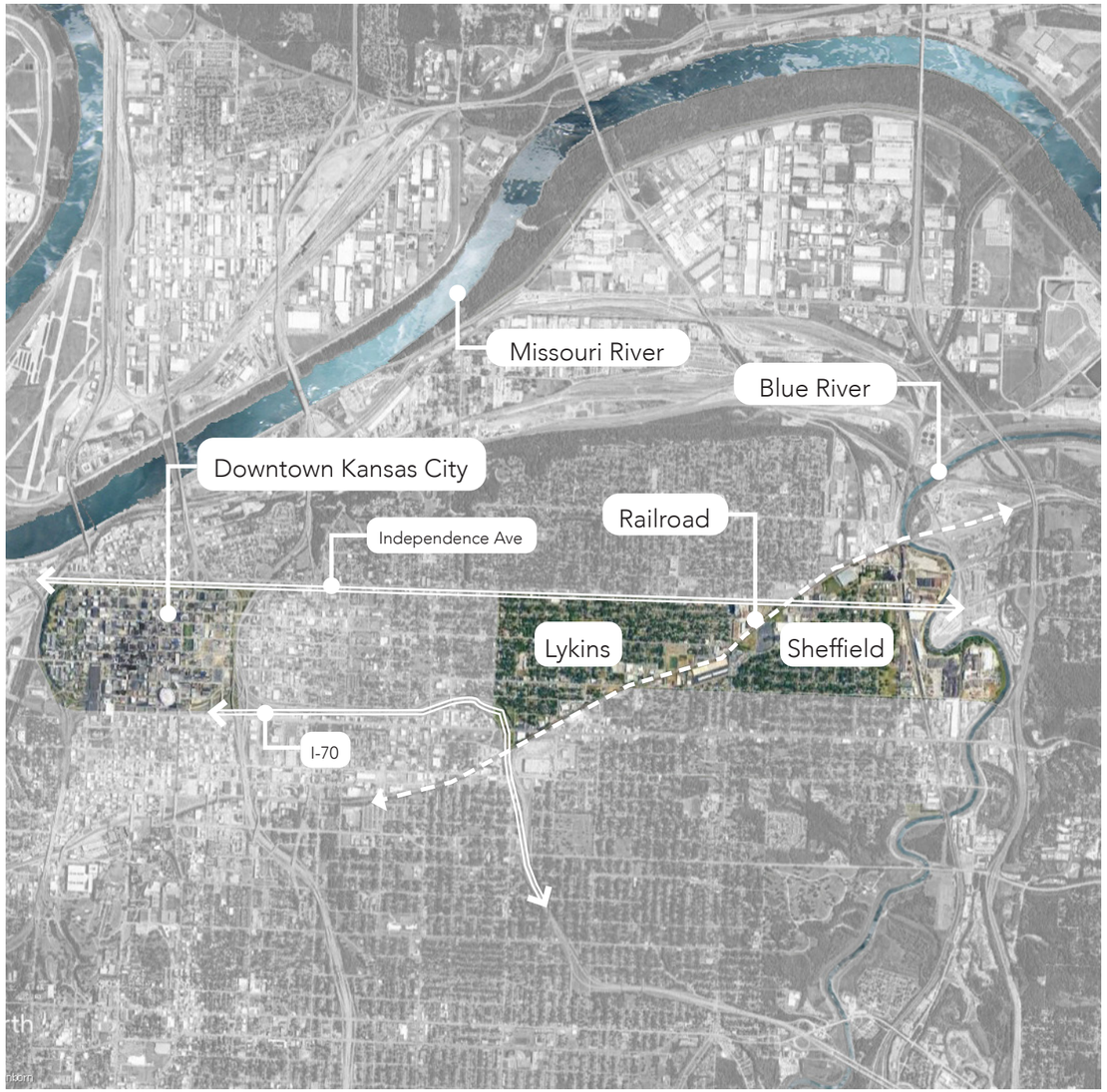


Figure 3.1 - Site context map

Methodology

Overview of types of data collected

Site data was collected using Google Earth, Google Street View, ArcGIS, photographs, and in person observation and analysis. Site data allowed analysis of contextual problems and conditions such as vacancy and crime. Datasets in ArcGIS revealed where vacant lots are located, surrounding population density, general demographic information, land uses, existing green spaces, and slope. Google Earth, Street View, and on-site observation show the general character of the site and how people currently occupy it (Figure 3.2, 3.3, 3.4, 3.5). These methods of data collection were important to create effective site inventory and analysis that informed the vacant lot reuse typology.

Data from the residents was collected during semi-structured interviews with residents. Interviews with residents captured qualitative data related to preference, culture, and social context. Data from participants provided guidance on what planting design strategies were appropriate for diverse types of vacant lots. Additionally, interviews revealed the local preferences for planting design instead of preferences originating from the designer.

Site Inventory & Analysis

Effective inventory and analysis of local conditions was completed to understand what and where potential improvements could be implemented. ArcGIS was vital in collecting initial data about the site. Slope, tree cover, impervious surfaces, sidewalks and access points were found with ArcGIS datasets. Google Earth and Street View were used to corroborate data from ArcGIS and correct any outdated datasets.

Cataloging of site conditions was imperative for future design development. Aerial imagery was taken from ArcGIS and site details and features were inventoried to gain a clear understanding of site conditions. These details work together to reveal the character of the existing site and informed design decisions. Site inventory revealed limitations for uses on each site and how the current environment allowed for only certain types of activities.

Figure 3.2 - Vacant lot in neighborhood setting (Weinberg 2019)

Figure 3.3 - Large vacant field (Chesney-Mateos 2019)

Figure 3.4 - Overgrown residential lot (Weinberg 2019)

Figure 3.5 - Small lot between two houses (Weinberg 2019)

Vacant Lot Reuse Typology

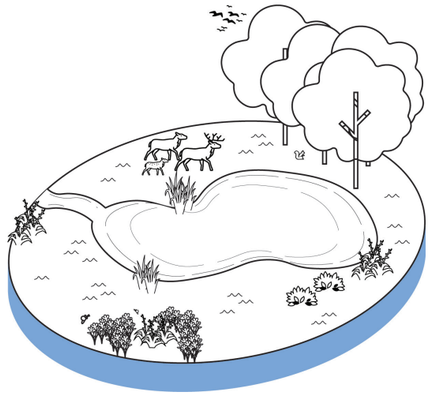
Site inventory and analysis led to classifying vacant lots into typologies based on suitable uses and current initiatives in the project area. The HCA has initiatives to repurpose vacant lot as ecological infrastructure like rain gardens, urban meadows, and other functions. A local agricultural group, The Urban Farming Guys, are in the Lykins neighborhood and help community members develop vacant lots into gardens. Existing initiatives are a great resource for the community, however there is an opportunity to reuse vacant land as social spaces.

The typology was essential in categorizing the diverse types of vacant lots and their existing conditions. Assigning vacant lot types was useful to later inform which planting design strategies would be used to meet local preferences. The categories of the vacant lot reuse typology are social uses, ecological uses, and agricultural uses (Figure 3.6). Social uses were found to be most important in this research since they provided opportunities for implementing the findings of this study in terms of encouraging social gatherings and activities.

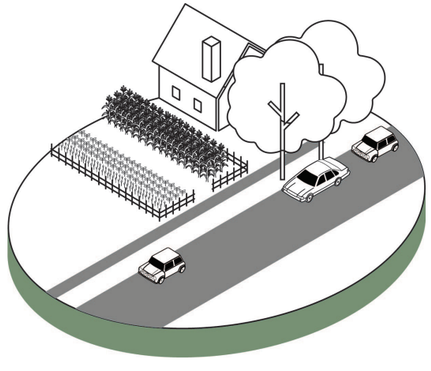
The vacant lot reuse typologies were created based on certain characteristics such as surrounding population density, drainage, slope, proximity to roads, lot size, and land use. Figure 3.7 shows how the different lot types were assigned suitable uses. **Social use** lots typically had characteristics of low slopes, near dense populations, outside of local drainage ways, near significant roadways or were highly visible to residents, and classified as residential land use. **Ecological use** lots were typically classified by medium to high slopes, among low populated areas, set back from large roadways, within drainage ways, and residential or industrial land uses. **Agricultural use** lots were defined by low to medium slopes, medium to high population density, out of drainage ways, and any type of land use.

The typology flowchart allows for some outliers due to preexisting vacant lot uses on the same block and proximity to similar lot types. Solid lines on the flowchart indicate ‘yes’ to the proceeding question and dashed lines indicate ‘no’. Lines ending on a flowchart typology indicate that category is suitable based on the proceeding conditions. The resulting map of vacant lots reveals that the flowchart prevents repetitious social and agricultural lot uses but allows for multiple ecological lots on the same block (Figure 3.8).

Social Use



Ecological Use



Agricultural Use

Figure 3.6 - Vacant lot typologies

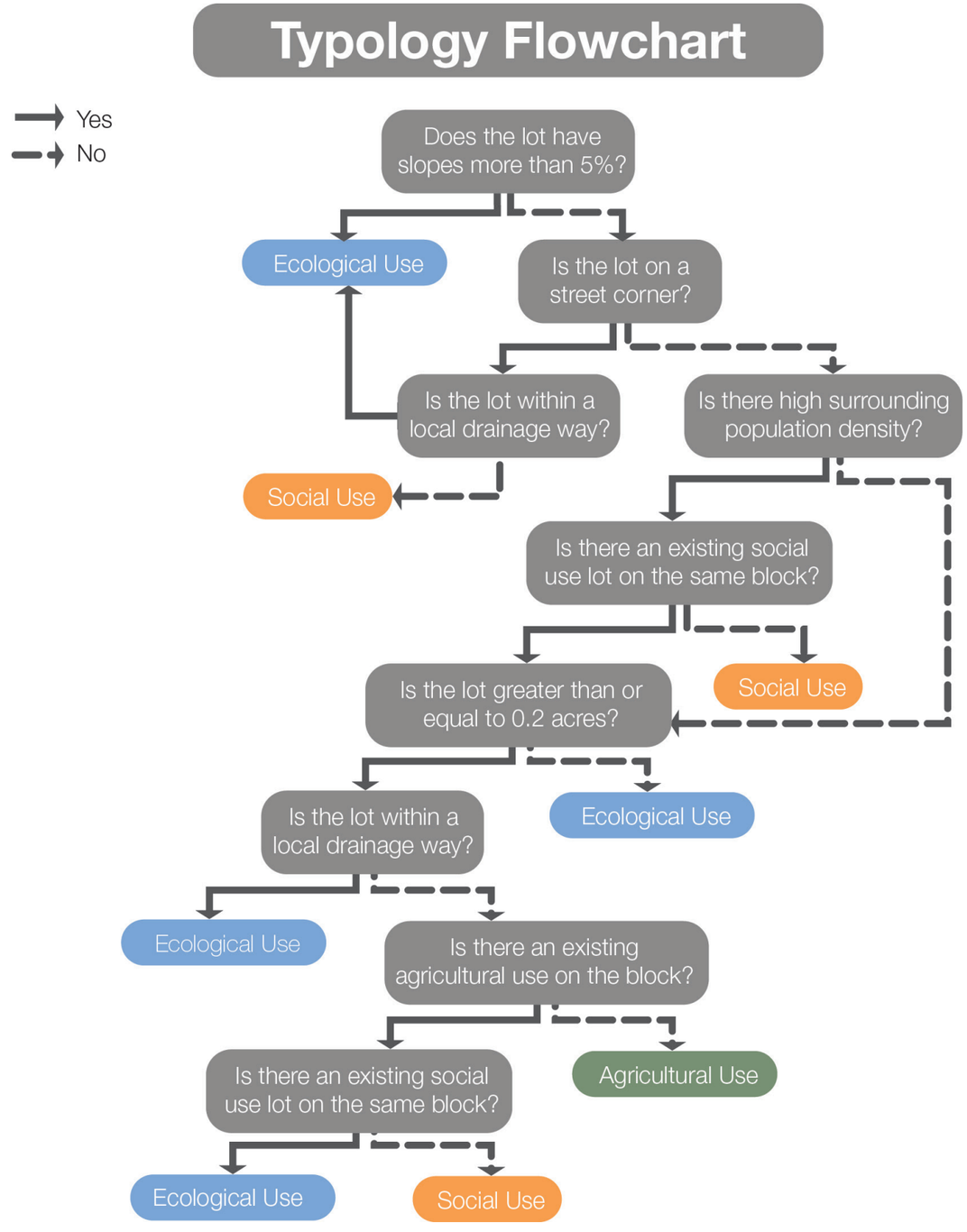


Figure 3.7 - Vacant lot typology flowchart

Figure 3.8 - Vacant lot typology distribution

Semi-Structured Interviews

Semi-structured interviews were the preferred method of data collection since preference feedback is qualitative in nature. Insightful questions and visual aids were required to initiate conversations about preference topics. Edited site images and guided interview questions were primary tools of data collection. Interview images were constructed from site photos of vacant lots and edited in Adobe Photoshop to create a rendered scene that represents the four preference categories from Kaplan and Kaplan's (1982; 1998) Preference Matrix.

During initial site inventory photographs were taken of vacant lots. Five of these vacant lots were selected for rendering based on typical social uses for outdoor spaces. These uses include play spaces for children and families, traditional park-like settings, small pocket parks, larger event spaces, and walking trail/nature parks (Table 3.1).

Each vacant lot contains some static seating and paving elements that remained consistent in each rendering. The only factor that changes in each set of photographs is the planting design. Different image sets were used to test if preferences for certain planting design principles remained consistent for different types of outdoor spaces. Each type of outdoor space was rendered four times, creating a total of twenty interview images. The four images for each outdoor space were rendered to represent the four design matrix categories; one image was designed for **coherence**, another for **legibility**, **complexity**, and **mystery**. Additionally, the five image sets were designed to have a range of preference matrix qualities. Images in different sets but of the same preference matrix category were rendered with different levels of coherence/legibility/complexity/mystery (Figure 3.9).

Interviews took about fifteen minutes to complete. Participants were debriefed and informed that a recording device was to be used interviews to help the researcher in cataloging and organizing data. No names or other identifying data was collected during interviews. Every participant was asked the same set of questions to capture reliable data (See Appendix E).

First, participants were asked to rate each set of site images based on preference, from highest preference to lowest. Second, participants were asked which photo in each set

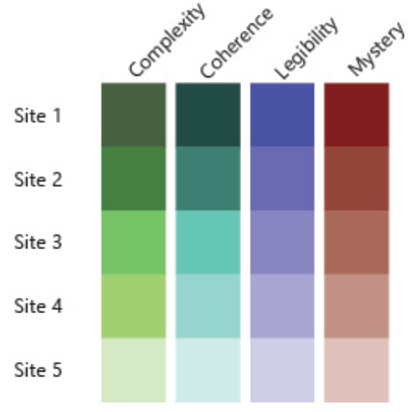


Figure 3.9 - Image framework scale

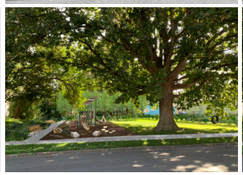
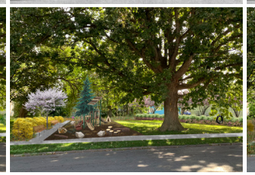
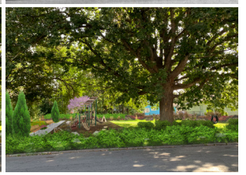
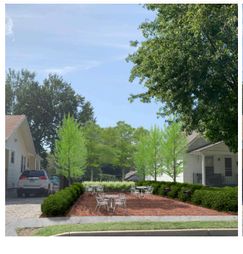
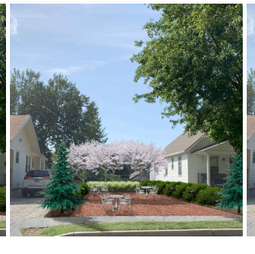
	Coherence	Legibility	Complexity	Mystery
1. Event Space				
2. Play Space				
3. Park Space				
4. Walking Trail				
5. Pocket Park				

Table 3.1 - The image framework with five types of space, each varying in levels of coherence, legibility, complexity and mystery.

they found most understandable (coherent), memorable and distinct (legible), had the most variety (complex), and likely to explore (mysterious). Third, participants were asked to discuss why they chose their highest rated images and lowest rated images. Discussion of their preferences helped the researcher discover planting design techniques and elements in the images that affected their choices.

Target Population, Sampling, and Subjects

Residents of the Lykins and Sheffield neighborhoods were invited to participate in the interviews. Neighborhood associations were critical in obtaining samples from the general population since these groups already have connections to the community and were able to contact them easily. Fliers were distributed through email and social media posts listing the location and times of interviews took place to get more randomly selected participants. Communication with the local Chamber of Commerce led to interviews taking place in a local business, Eleos Coffee House (Figure 3.11).

Customers could be invited, and pre-appointed interviews were held in a safe, public environment. A small research grant was used to offer incentives to interview participants and obtain data more quickly. Ten-dollar gift cards to Eleos Coffee House were issued to each interview participant upon completion of an interview. Sample size goal for this study was 25-30 participants and 26 participated.

Lykins and Sheffield are diverse neighborhoods and a moderate population density. Prominent ethnicities in the are are Hispanic (51%), White (26%), Black (17%), Asian (5%), and other ethnicities (1%) (Figure 3.11). A majority of the residents in the area are adults (68%) with a smaller population of minors (32%). Additionally the population density varies across the site. Lykins is more densly populated near Independence Ave. and Sheffield densly populated in the Southwest corner (Figure 3.13).

Subjects for the interview were adults over 18 years old. There was no biased sampling based on demographics other than having a proportional amount of male and female subjects. Holding interviews in a coffee shop likely excluded some residents and holding interviews in a different location could have effected participant diversity. Demographic factors such as race and gender can play a significant role in preference for vacant lot reuses and green spaces in general (Virden and Walker 1999). Interviews captured basic demographic information of gender, race, and approximate age, however this report focuses on environmental psychological aspect of preference and demographics were not focused on in this research.

Figure 3.10 - Interview location at Eleos Coffee in Lykins

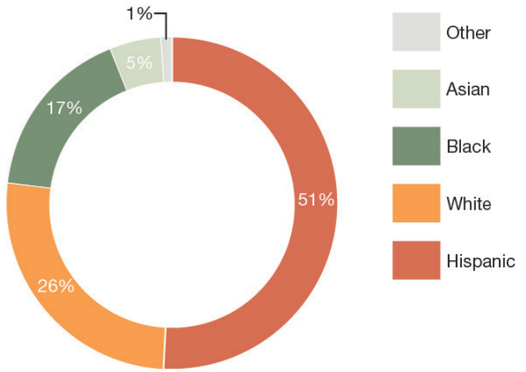


Figure 3.11 - Project Site Racial Demographics

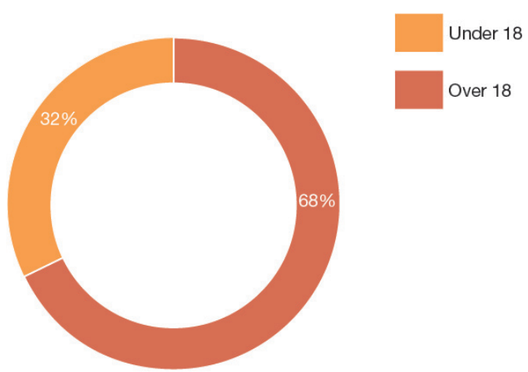
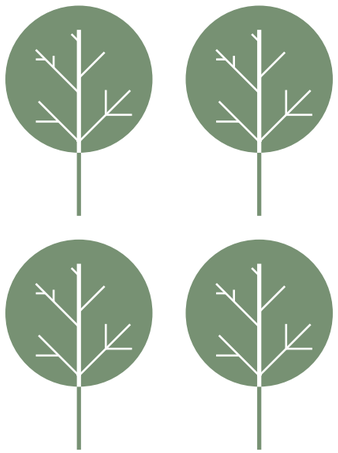
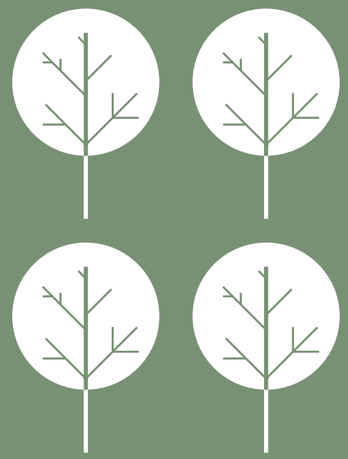


Figure 3.12 - Project Site Age Demographics

Figure 3.13 - Project Site Population Density





Analysis & Findings

Participant Results

Demographics

Twenty-six participants volunteered for interviews (Table 4.1). Basic demographic information was recorded; however, this data was not focused on during analysis due to limited variation in sample population. Because of the small sample size and lack of variability, the sample was not necessarily representative of the site population. Participants were 58% male and 42% female. Also, participants were not racially diverse with 92% white and only 8% black. The median age of all participants was 42 (Table 4.2).

Image Rating Analysis

Semi-structured interview questions collected three different sets of data. The first question revealed which images on average were most preferred. This data is important because it reveals which visual qualities are most preferred in landscapes. The most preferred images in each set were: Image 1.D, Image 2.B, Image 3.B, Image 4.C, and Image 5.D (Table 4.3). Two of the most preferred images were Mysterious, two were Legible, and one was Complex.

Participant Demographics			
Participant	**Gender**	**Race**	**Approx. Age**
1	F	White	40
2	F	White	40
3	M	White	60
4	M	White	60
5	F	White	20
6	M	White	40
7	M	White	20
8	M	White	50
9	M	White	50
10	F	White	40
11	F	White	20
12	F	White	50
13	F	White	40
14	M	White	60
15	F	White	60
16	M	White	40
17	M	White	20
18	M	White	30
19	M	White	30
20	M	Black	40
21	F	Black	30
22	F	White	60
23	F	White	60
24	M	White	20
25	M	White	50
26	M	White	50

Table 4.1 - Overall participant demographics

Demographic Averages					
	Males	**Female**	**White**	**Black**	**Age**
Average Participant	58%	42%	92%	8%	42

Table 4.2 - Average participant demographics

	Coherence	**Legibility**	**Complexity**	**Mystery**
1. Event Space				
2. Play Space				
3. Park Space				
4. Walking Trail				
5. Pocket Park				

Table 4.3 - Average image ratings

Ratings & Scale Analysis

Participant image ratings were also compared to the scale of which preference matrix categories were applied in each image (Table 4.4). Interview images were designed with various amounts of coherence, legibility, complexity and mystery to analyze how intensely certain planting design techniques should be applied. Analysis revealed that participants preferred, on average, images that were highly coherent, highly legible, highly complex, and moderately mysterious. The images with the lowest participant ratings were most preferred. Participants were asked to rate images from 1-4, one being the most preferred and 4 being the least preferred.

Preference Matrix Rating Analysis

The second question in the interview asked participants to rate which image in each set they found the most coherent, legible, complex, and mysterious. These specific terms were not used, but participants were indirectly asked, in lay terminology, about these concepts. This question revealed what qualities they perceived in their favorite image and how significant each matrix category was in overall design of outdoor space.

On average participants assigned the correct matrix category to their favorite image. Additionally, participants assigned other categories from the preference matrix to the highest rated images indicating that a blend of matrix categories is needed to create a highly preferred outdoor space. Assigning matrix categories to images in each set led

Ratings Comparison

Matrix Category	Image #	Author Design Scale	Participant Rating
Coherence	Image 4.A	1/5	3.2
	Image 2.A	2/5	2.9
	Image 3.A	3/5	3.2
	Image 1.A	4/5	3.2
	Image 5.A	5/5	2.4
Legibility	Image 2.B	1/5	2.2
	Image 5.B	2/5	2.3
	Image 1.B	3/5	2.3
	Image 4.B	4/5	2.3
	Image 3.B	5/5	1.7
Complexity	Image 2.C	1/5	2.6
	Image 3.C	2/5	2.2
	Image 1.C	3/5	2.8
	Image 5.C	4/5	3.0
	Image 4.C	5/5	2.0
Mystery	Image 4.D	1/5	2.4
	Image 2.D	2/5	2.3
	Image 1.D	3/5	1.7
	Image 5.D	4/5	2.3
	Image 3.D	5/5	2.8

Table 4.4 - Ratings comparison table

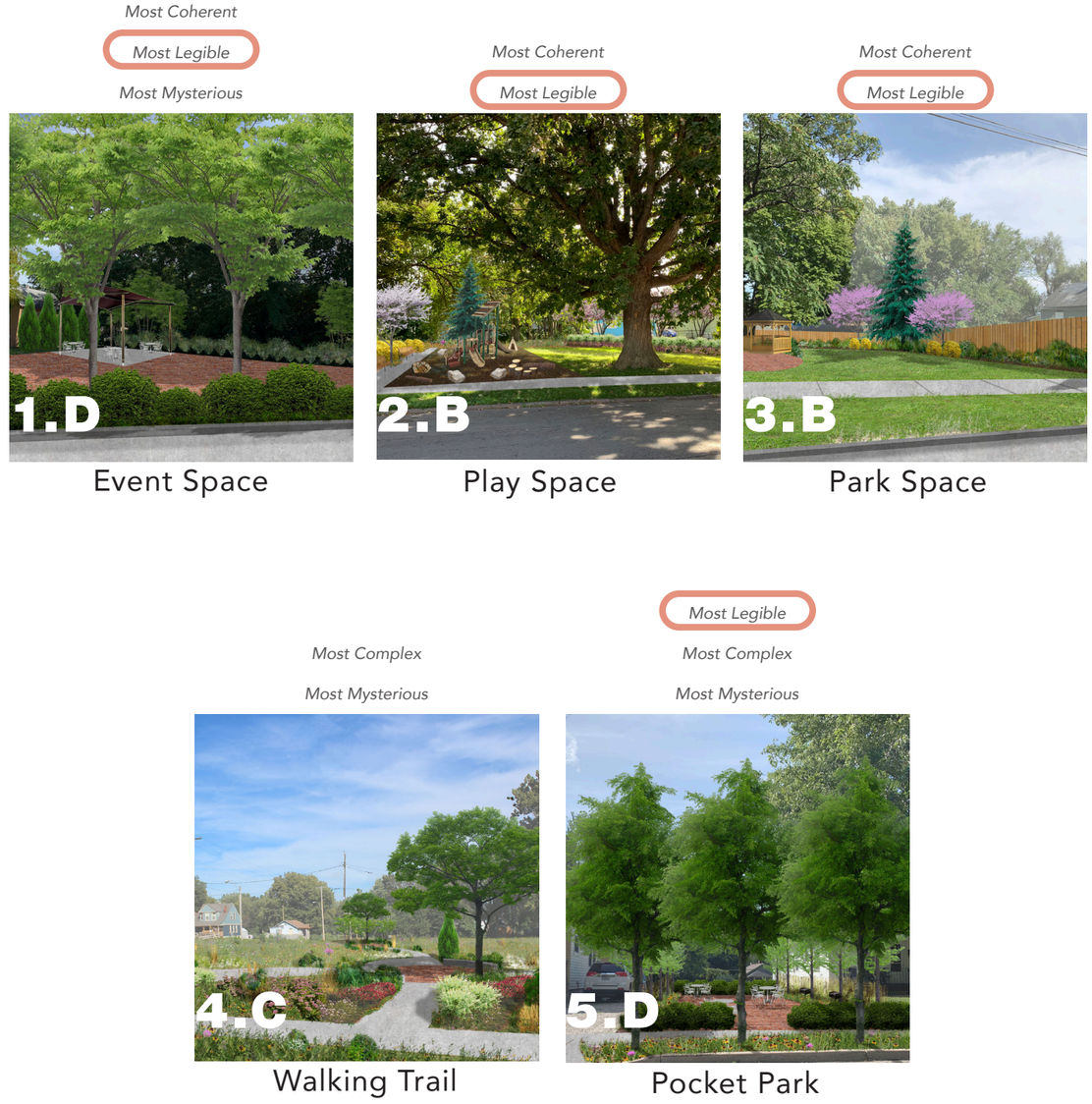


Figure 4.1 - Participant preference matrix ratings

to initial conclusions on which planting design principles were important for each type of space. Out of all five image sets participants rated the favorite images as Legible (4 times), Coherent (3 times), Mysterious (3 times), and Complex (2 times) (Figure 4.1).

Keyword Analysis

The next step in the interview had participants explain why they chose their highest rated photo and lowest rated photo. Transcribed interviews were searched for keywords which were extracted and organized for analysis. Five broad categories of keywords emerged during analysis. Participants frequently spoke about the plantings, spatial arrangement, their emotional responses, environmental factors, and potential activities (Figure 4.2). These keyword categories were further assigned subcategories to help identify important topics. Keywords were also separated into positive and negative categories for each image; positive if the participant liked or appreciated the respective aspect of the image, and negative if the participant did not like a certain aspect of the image.

Identifying positives and negatives about each photo was important to understand which aspects of planting design were preferred and which were not preferred. Keywords were counted to understand how often certain topics were talked about during interviews. Positive and negative keywords were counted to understand which aspects of images were well received, poorly received, or polarizing. Keywords were synthesized into general statements for each category about likes and dislikes.

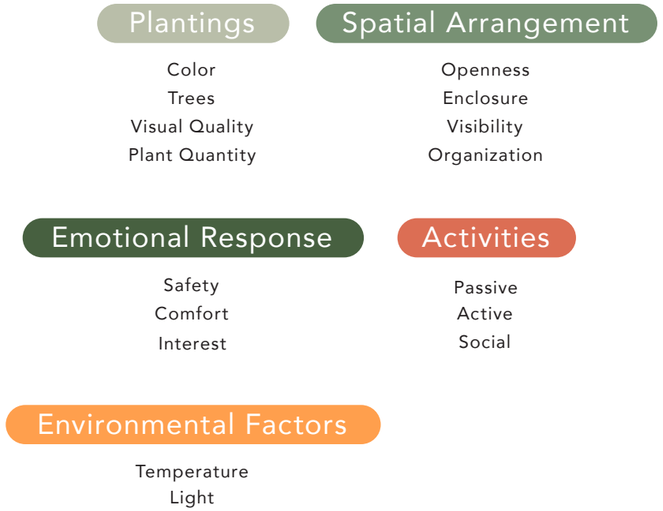


Figure 4.2 - Keyword categories

Keyword Sub-Category Count			
	Keyword Sub-Category	**Subcategory Count**	**Total Count**
Plantings	Visual Quality	121	432
	Trees	109	
	Color	86	
	Plant Quantity	65	
	Flowers	34	
	Bushes	17	
Spatial Arrangement	Open	98	296
	Organization	95	
	Enclosure	69	
	Visibility	34	
Emotive Responses	Safety	38	121
	Comfort	34	
Environmental Factors	Light	60	77
	Temperature	17	
Activities	Passive	70	72
	Active	34	
	Social	17	

Table 4.5 - Keyword count reveals important topics

Keyword categories that were most often mentioned were **plantings** (432 times), **spatial arrangement** (296 times), **activities** (121 times), **environmental factors** (77 times), and **emotive terms** (73 times) (Table 4.5). Keyword analysis revealed that negative comments were typically in response to a lack of preferred landscape elements. For example, when participants talked about color in a landscape, they frequently spoke positively of color variety but spoke negatively about a lack of color. The average participant preferred considerable amounts of trees, color variety and greenery, inviting and natural looking scenes, and variety of plant types and textures (Table 4.6). Participants did not like images with a lack of color, too few trees, boring and unorganized plantings, little variety, and repetitious plantings. They also preferred plantings with high variety (type of plants, size, color, texture) and those that are organized and natural looking. These preferred planting strategies found after analysis align with the Preference Matrix categories of **Complexity** and **Coherence**.

Spatial arrangement was a significant conversation topic during interviews. Analysis revealed that participants positively commented on images that were open enough for various activities but offered feelings of seclusion and privacy from the outside looking in (Table 4.7). Good visibility was highly preferred along with organized and maintained plantings. Participants did not prefer extremes in spatial arrangements. Images that were too open, too enclosed, or poorly visible were negatively perceived. Unorganized planting beds were also criticized as cluttered and messy. Spatial arrangement keywords indicate that Preference Matrix categories of **Mystery**, **Coherence**, and **Legibility** are crucial factors in constructing outdoor space in the project site.

Potential **activities** in interview images were also discussed frequently by participants. Keywords indicated that passive activities such as sitting, reading, and eating were important to participants (Table 4.8). Active activities like walking or exploring were also frequently mentioned along with various social activities. Analysis revealed that **adequate seating** is needed for people to enjoy passive and social activities. This analysis does not align with any Preference Matrix category; however, it will inform future design decisions.

Plantings Keywords							
		Color	Trees	Bushes	Flowers	Visual Quality	Plant Quantity
Positive	# of times topic was mentioned	60	88	16	30	64	38
	General conclusions	Liked color variety and greenery	Liked - amount of trees and ornamentals		Liked - colors and variety of wildflowers	Liked scenes that were inviting and natural looking	Liked variety of plant types and textures
Negative	# of times topic was mentioned	26	21	1	4	57	27
	General conclusions	Disliked - lack of color or clashing colors	Disliked - lack of trees or overplanting of trees		Disliked - lack of flowers	Disliked images that were boring and unorganized	Disliked lack of variety and over-repeated elements

Table 4.6 - Plantings keywords reveals general preferences for planting design

Spatial Arrangement Keywords					
Positive/ Negative		Open	Enclosure	Visibility	Organization
Positive	# of times topic was mentioned	61	55	17	55
	General conclusions	Liked enough open space for various activities	Liked feeling of seclusion and privacy offered by plantings	Liked being able to see what is going on around you	Liked organized and maintained images
Negative	# of times topic was mentioned	37	14	17	40
	General conclusions	Disliked spaces that were too open and unprotected	Disliked images that were too closed off	Disliked obstructed views	Disliked unorganized images

Table 4.7 - Spatial arrangement keywords reveal preferences for how plantings should be constructed

Emotive Terms Keywords			
Positive/ Negative		Safety	Comfort
Positive	# of times topic was mentioned	25	27
	General conclusions	Overall images made participants feel safe	Colorful, dense plantings made people comfortable
Negative	# of times topic was mentioned	13	7
	General conclusions	More mysterious images made some people feel unsafe	Exposed, open images made people feel uncomfortable

Table 4.8 - Emotive keywords revealed how people felt about the designs

Environmental Factors Keywords			
Positive/ Negative		Temperature	Light
Positive	# of times topic was mentioned	5	41
	General conclusions		Liked images that had plenty of shade
Negative	# of times topic was mentioned	12	19
	General conclusions	Disliked images that were too sunny and hot	Disliked images that did not have enough shade

Table 4.9 - These keywords revealed how much shade was preferred in designs

Activities Keywords				
Positive/ Negative		Passive	Active	Social
Positive	# of times topic was mentioned	62	31	17
	General conclusions	Liked images that had places for passive activities like sitting, reading, eating, etc	Liked images that allow walking and exploring	Liked images that were open enough for social activities, but private enough to offer some protection
Negative	# of times topic was mentioned	8	3	0
	General conclusions	Disliked images with lack of seating		

Table 4.10 - Preferred activities in outdoor spaces were revealed

Participants also mentioned **environmental factors** of light and temperature. **Shade** was highly preferred by participants and images without tree canopy and shade were often not preferred (Table 4.9).

Participants **emotional responses** revealed that certain amounts of seclusion and openness was preferred (Table 4.10). The more mysterious images made some participants feel unsafe due to low visibility and high seclusion. Highly coherent images also made people feel uncomfortable because they would be highly exposed. This finding supports the ratings data that moderately mysterious images are most preferred along with coherent images that are balanced with **legibility** and **complexity**.

Synthesis

Overview

Comparison of data from each set of analysis reveals valuable information about participant preference. Image ratings revealed that mystery, legibility, and complexity (and their associated planting design principles) are important to visual preference. Similarly, participants preferred images that were classified as highly coherent, legible, and complex, and images that were only moderately mysterious. Matrix ratings revealed the significance of each matrix category in overall design and that a blend of matrix categories is needed to create a preferable landscape scene. Keyword analysis revealed that coherence, legibility and mystery were crucial in spatial arrangement. Coherence and complexity were important in how plantings were formed. Also, balance between mystery and coherence was needed to create comfortable environments.

Analysis Synthesis					
	Image Ratings (How many times a matrix category was chosen)	**Matrix Classification** (How many times a matrix category was assigned to favorite images)	**Design Comparison** (Which scale of matrix intensity was chosen as favorite)	**Keyword Analysis** (How many times keywords revealed importance of matrix category)	**Totals**
Coherence	0	3	5	2	10
Legibility	2	4	5	2	12
Complexity	1	2	5	1	9
Mystery	2	3	3	2	10

Table 4.11 - Analysis was instrumental to understanding which preference categories were most preferred, and by extension which planting design techniques

Combining all four analysis elements reveals a clear preference for certain matrix categories. The four analysis elements (image ratings, matrix classification, design comparison, and keyword analysis) were organized into a table and each matrix category was assigned a number according to the importance participants perceived it had (Table 4.11). These numbers were totaled up to indicate the amount of times participants found it important.

Legibility was found to be the most important preference matrix category closely followed by coherence and mystery, and last was complexity. It should be considered that ranking the preference matrix categories does not necessarily mean that one is more important than the other, but that some categories are *more preferred* by the participants in certain contexts. Since the results of this study are highly subjective, the results could vary based on the number of participants and their personal preferences. A delicate balance of preference matrix categories is needed to create a highly preferable landscape.

Design Implications

The five keyword categories revealed important design elements for participants. Plantings, spatial arrangement, activities, environmental factors, and emotional responses will be focused on during design development of vacant lots (Figure 4.3).

Participant preference and concerns for each factor will be addressed through important planting design principles revealed through analysis. The planting preference matrix (Table 2.1) will be used to understand which planting design principles are most preferred based off analysis shown in Figure 4.3.

Findings suggest that plantings should be colorful and complex yet remain organized and neat. Planting design principles of unity, balance, color, and variety could help meet local preferences. Spatial arrangements with good visibility, clear organization, and moderate degrees of enclosure were highly preferred. Planting design principles of visual connection, rhythm, and proportion are preferred in the configuration of physical space. Participant feedback on activities in outdoor space suggests that seating is a critical element in creating a comfortable outdoor environment.

Analysis led to the development of five planting design guidelines (Figure 4.4). First, it is proposed that planting designs be legible (memorable and distinct) using color and visual weight. Second, it is proposed that planting designs be coherent (organized and easy to understand) using principles of unity, rhythm and balance while still being mysterious (encouraging exploration) through strong visual connections, and degrees of enclosure. Third, it is proposed that planting designs be complex in the variety of plants, texture, and density without being unorganized or masking distinct elements. Fourth, it is proposed that planting designs create spaces for appropriate activities for each type of social space (seating space, play space, etc.). Fifth, it is proposed that planting designs create comfortable environments with appropriate amounts of shade for each type of social space and the activities in it.

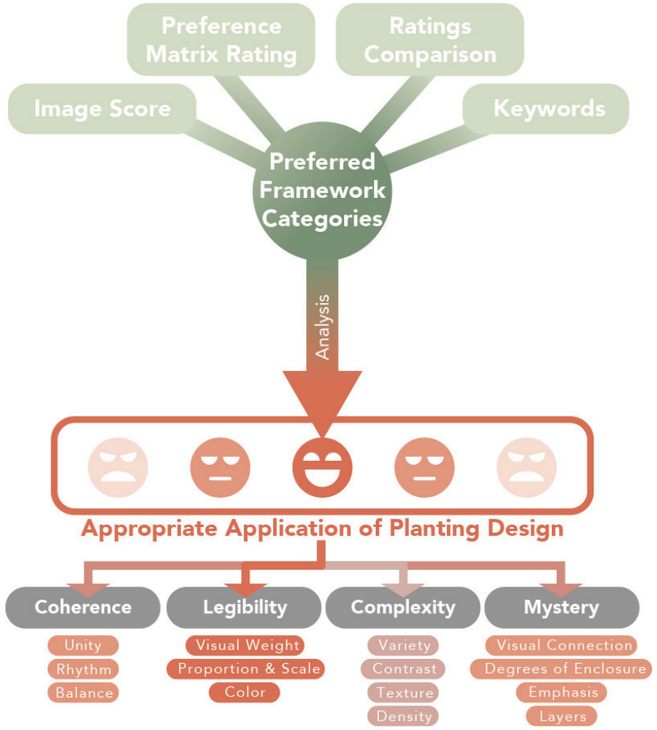
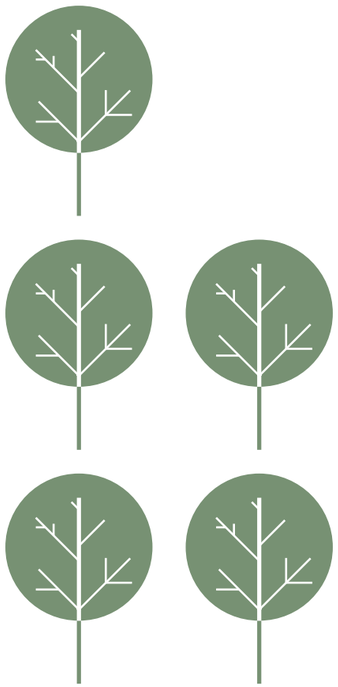
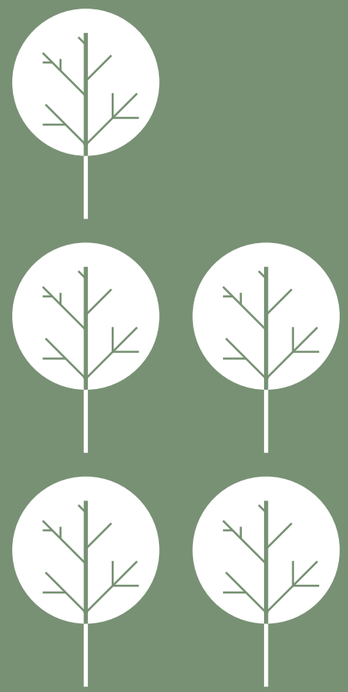


Figure 4.3 - Analysis Process

Figure 4.4 - Guidelines for design process





The Project

Overview of Project Site

Vacant lots in Lykins & Sheffield

Lykins and Sheffield neighborhood parcels cover an area of 1071 acres or 1.7 square miles (4388 lot parcels). Vacancy is a sizable issue with 134 vacant acres (734 parcels), or 12.5 percent of parcel land area (Figure 5.1). Most of these vacant lots are privately owned and may not be feasible for future development. The City of Kansas City or the Land Bank of Kansas City Missouri owns 25.6% of vacant land in the project site (196 vacant lots) (Figure 5.2 – Publicly owned lots). Publicly owned lots present an opportunity for planting design research to be applied since funding could be procured from the Land Bank or the City of Kansas City. Vacant lot improvement programs are also underway in each organization and new development strategies, such as planting design according to local preferences, could be implemented.

Site Selection Process

Vacant lots in the Lykins and Sheffield neighborhoods have been organized into three distinct typologies: social use, agricultural use, and ecological use (Figure 3.6). Lots assigned to social uses have been further classified to identify potential uses for each lot. Five types of social lots were identified based on common uses of outdoor green space. These types correlate with the five image sets rendered for semi-structured interviews (Figure 3.9). Social lot types are traditional park spaces, pocket parks, event spaces, play areas, and walking trails (Figure 5.3 – site type isometrics). The five lot types were classified using flow chart logic based on vacant lot conditions (Figure 5.4 – site flow chart). Factors that influenced choices were lot size, population density, and lot location.

Lykins and Sheffield contain 61 lots that are suitable for social uses that are also city or land-bank owned (Figure 5.5). Five vacant lots were selected to create conceptual planting plans based on preference feedback (Figure 5.5). Each lot was selected for unique attributes that will allow for multi-functional, interesting spaces. Selected vacant lots could function as examples for any future development of social use lots and could initiate new programs of vacant lot redevelopment.

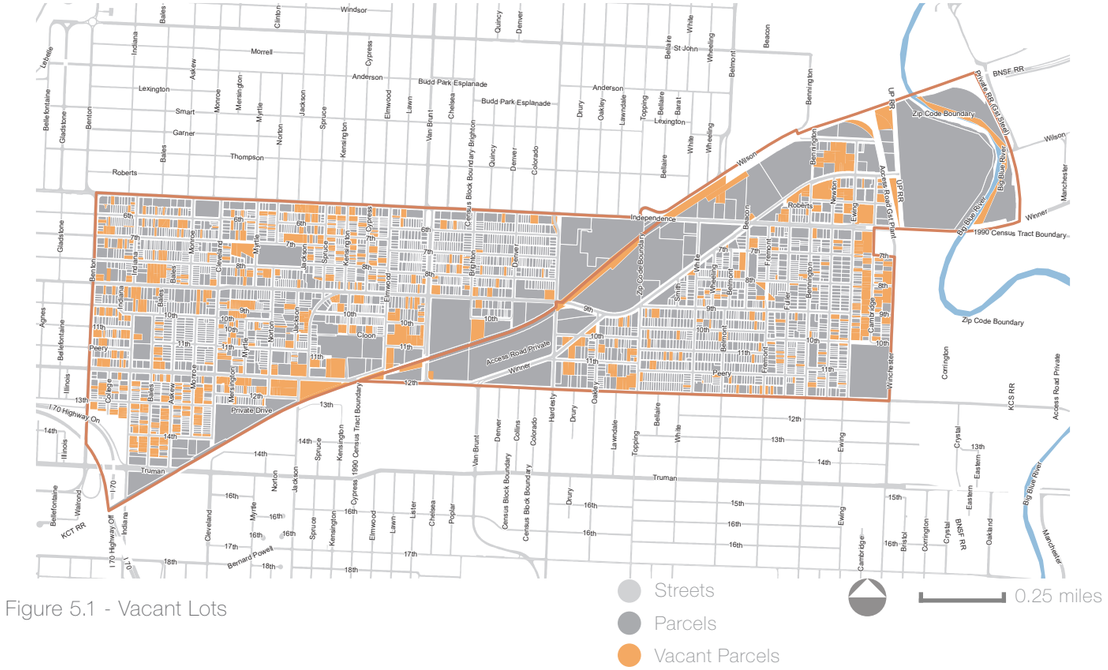
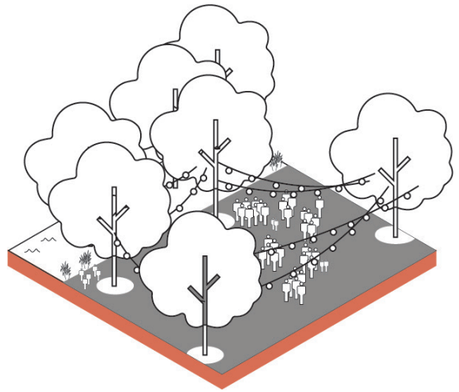
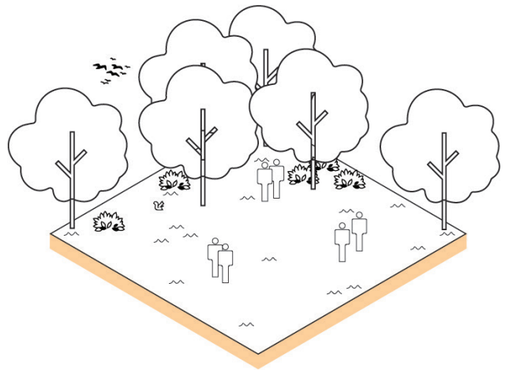


Figure 5.1 - Vacant Lots

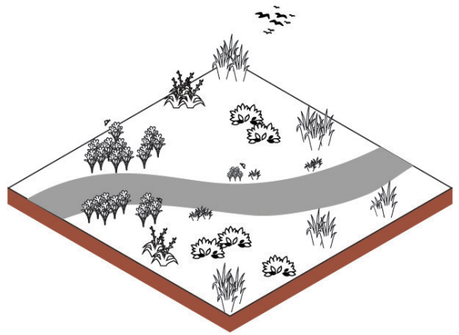
Figure 5.2 - Publicly owned lots



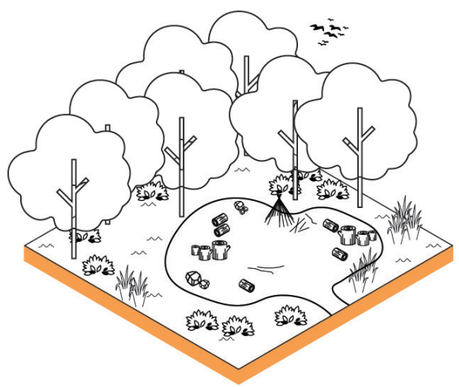
Event Space



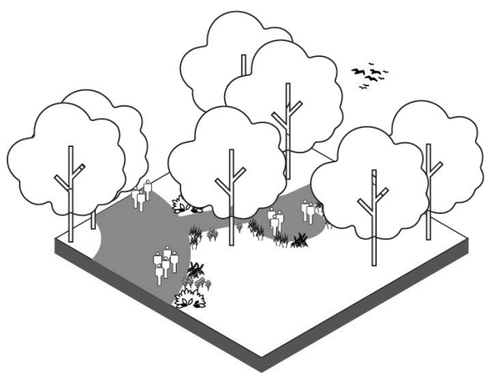
Traditional Park Space



Walking Trails



Play Areas



Pocket Parks

Figure 5.3 - Site type isometrics

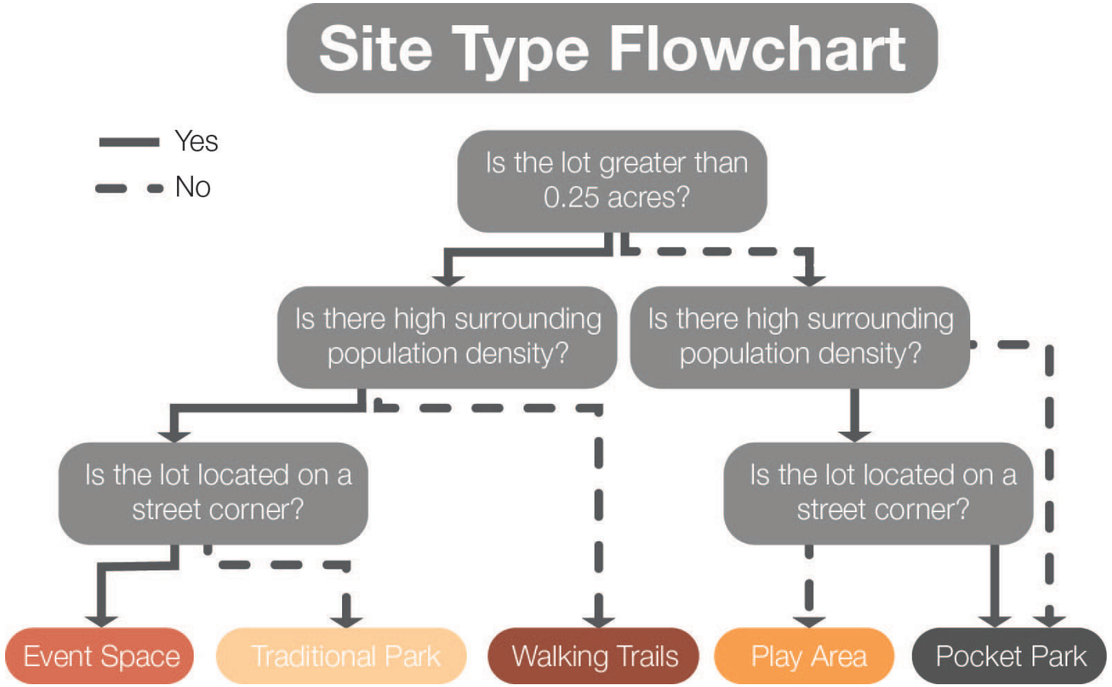


Figure 5.4 - Site type flowchart

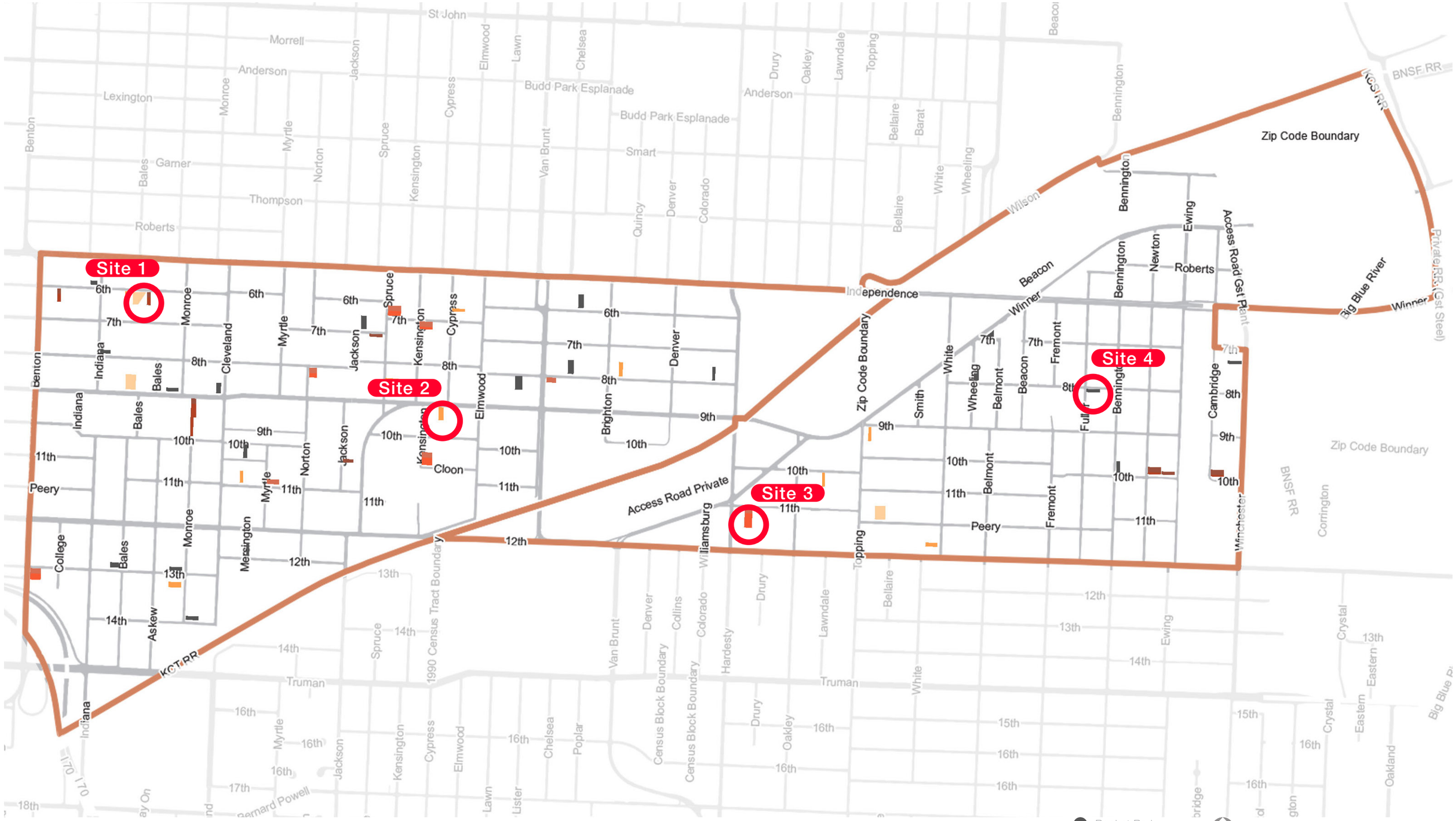


Figure 5.5 - Social lot type map

Site 1 – Nature Park

Inventory & Analysis

Site 1, located at 3431 E. 6th St. in the Lykins neighborhood, is unique because there are three adjacent vacant lots each with a different assigned use (Figure 5.6). The lot furthest west is classified as a traditional park, the middle lot is an ecological lot, and the eastern most lot is assigned a walking trail use. The adjacency of these three lots allows for unique combinations of plantings and activities.

Currently, all three vacant lots are empty, except for five mature trees in a range of conditions. The site is somewhat maintained, however there is overgrown vegetation on the south side due to steeper slopes. Most of the site is suitable for development into the assigned uses. Mature trees are in good condition except for a spruce tree that was removed from the design. Remaining trees were incorporated into conceptual design to ensure that shade and comfort preferences were met in the immediate future.

Site Design

The adjacency of three different lot types allowed for a unique and interesting arrangement of spaces in nature park. All three of these different lot types are not unique; however, their adjacency allows their various aspects to be combined in interesting ways that could benefit nearby residents. The northwest portion of the site, the traditional park lot, was developed into typical program elements that are found in city parks. Open lawn areas for various activities and seating were designed. Additionally, plenty of shade was provided by the pre-existing mature trees that were preserved and new plantings throughout the site (Figure 5.7). The adjacent ecological lot and walking trail lot were merged into a single functional lot. Ecological and walking trail attributes extended through both lots. The walking trails lead to the traditional park space lot and connect to seating and activity areas. The ecological aspect of this site includes new pollinator plantings, a rain garden, and small animal habitat. This nature park serves as an educational and recreational amenity to residents in the area (Figure 5.8).

Figure 5.6 - Nature Park existing site

Participant Feedback

Participant preferences influenced the design process for Nature Park. Participants desired plantings that were colorful and memorable while having unity, balance, and a sense of enclosure (Figure 5.8). The planting design ensured that all the plantings allowed for each space to be highly visible (Figure 5.9). The views into the site are open and all parts of the site can be seen from the street. Plantings were low enough to be seen over or high enough to be seen through. Planted trees are insured to have high canopies so that there would be no obstructed views within the entire site. The entire planting design was made to have seasonal interest in spring, summer, fall, and winter. This will help ensure that the site will be used throughout the entire year and not just at certain times in seasons.

Participant data revealed that visibility was a particularly important aspect in the designs of all spaces, but participants also wanted the sense of privacy and enclosure that very mysterious images had. A sense of enclosure was accomplished by using plants as structural elements such as overhead planes with tree canopies and low plantings on the ground plane (Figure 5.10). This gave a sense of privacy but allowed for visitors to see into the space while passing by and to see out of the space while within the site. Taller plantings were used in the back of the site and near adjacent homes to create a sense of seclusion while allowing for visual permeability. Plantings are complex but are organized into distinct masses, so the landscape remains legible and coherent (Figure 5.7 & 5.9).

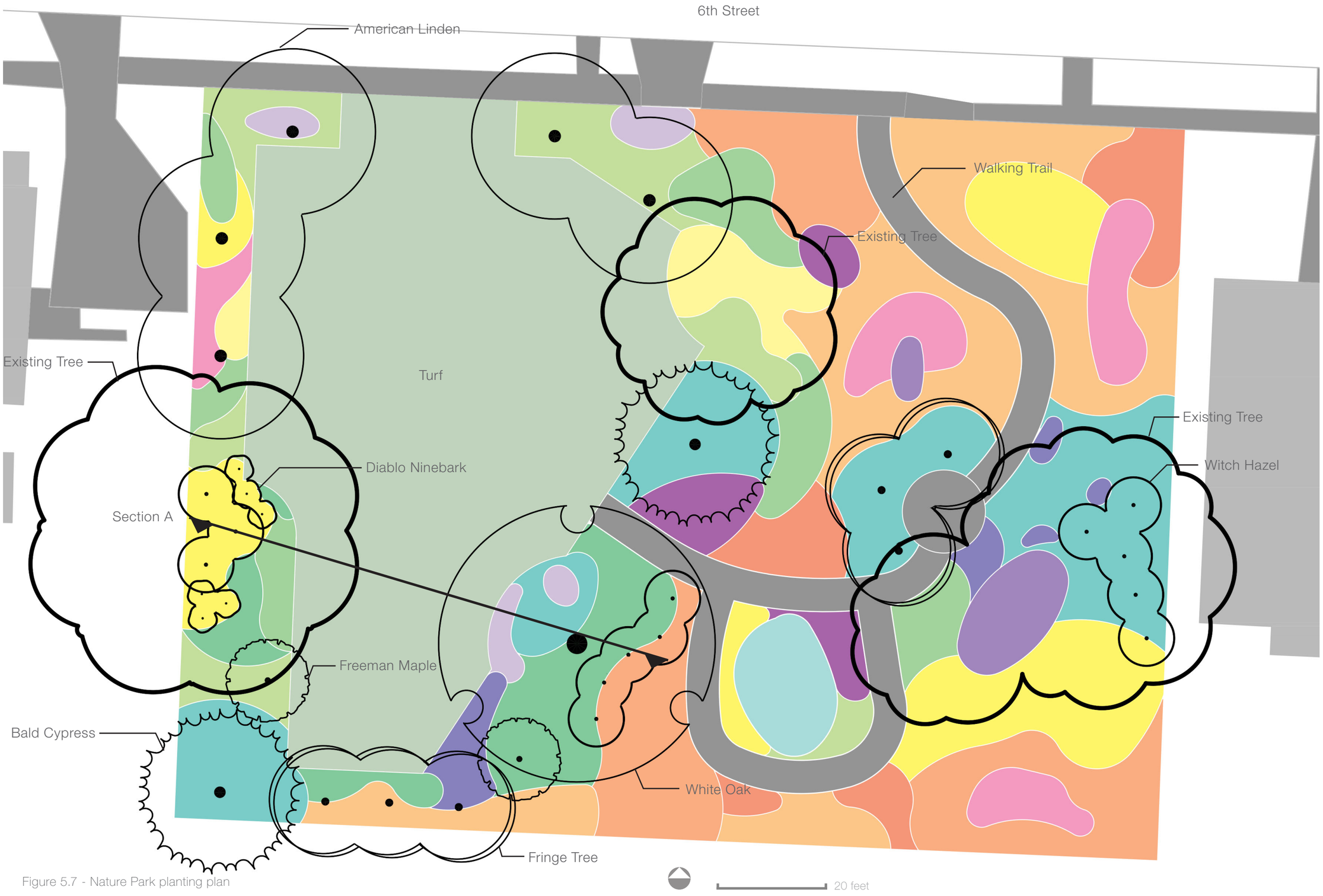


Figure 5.7 - Nature Park planting plan

Figure 5.8 - Walking path through Lykins neighborhood Nature Park

Figure 5.9 - Main lawn area adjacent to 6th St. in Lykins

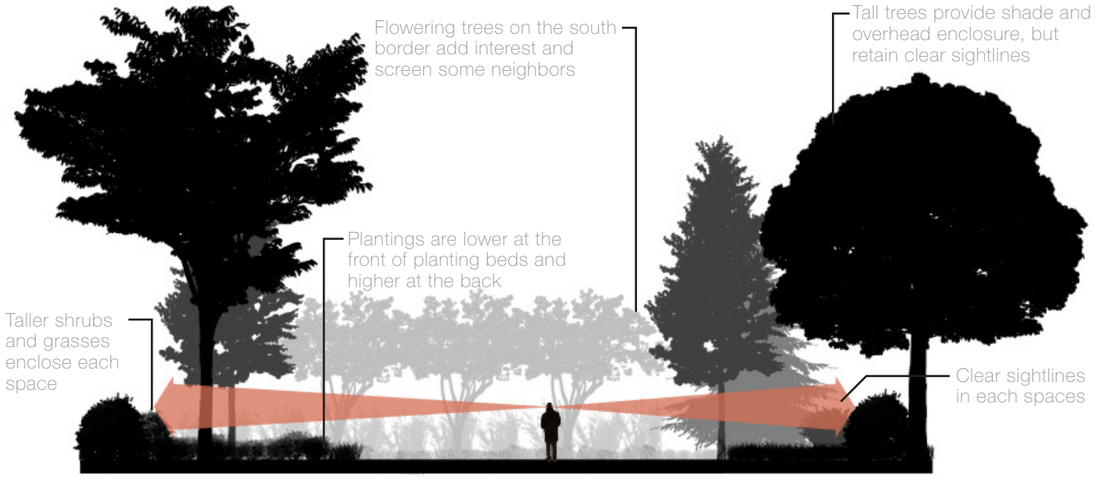


Figure 5.10 - Section A - main lawn area

Site 2 – Food & Fun

Inventory & Analysis

Site 2, located at 4409 E 9th St. Kansas City, Missouri also is unique because of two different lot types that are adjacent to one another (Figure 5.11). The west lot was categorized as an agricultural use and the lot on the east was categorized as a play space. This site was chosen for further development because the combination of an agricultural use such as a community garden, orchard or other type of food production would benefit from having a play space for neighborhood children and parents to gather.

Both lots are vacant with no existing structures. Google Earth imagery revealed that the site is very flat since it was bulldozed less than a year ago. GIS data was incorrect since it slopes in some areas. Currently there is little vegetation on the site besides weeds and invasive species. However, neighboring properties have large mature trees that could potentially provide shade in the morning and late afternoon to evening. The site was very accessible visually and physically as there are no barriers to enter. There is a well-kept sidewalk bordering 9th street to the north of the site and there is an alleyway that cuts through the entire middle of the block just south of the site. The openness of this site with the lack of shade and high access make it ideal for an agricultural use, and with aid from planting design it is ideal for a play space as well.

Site Design

Since this site has two vastly different lot types, the planting designs will be different for both. The agricultural lot will have shorter plantings so any agricultural practices implemented on the site will receive full sun. The play space lot will have more intensive planting design. Colorful plantings that are complex in texture and variety were implemented along with organized placement that maintains good visibility (Figure 5.12). The play space planting design has the highest visibility out of any designed site in this project (Figure 5.13). High visibility is necessary in a play space so that parents can constantly know where their children are. Visibility will be maintained across the two types of lots so that parents can keep an eye on their children while they are working in the nearby community garden (Figure 5.13 & 5.15).

Figure 5.11 - Food & Fun existing site

The agricultural portion of the site will be highly visible from the sidewalk and street so people may see how the lot is being used and community efforts in agricultural production. The play space portion of the site will be less visible from the sidewalk and street. Plantings were placed at the north and south side of the lots to separate them from the street and alley (Figure 5.14). The plantings adjacent to the sidewalk and street are low and create an implied boundary, making the lot seem more private (Figure 5.14).

Participant Feedback

While the participant data revealed that moderate mystery in planting design for outdoor space was preferred, the play space image set scored slightly different on keyword analysis. Participants preferred minimal visual and physical barriers between seating, open space, and children play areas (Figure 5.16). Other planting design principles under the matrix categories of coherence, legibility, and complexity remain the same. Some planting design principles implemented in the agricultural use lot do not result from participant data since sunlight is a crucial factor in growing crops. Plantings in the agricultural use lot are shorter and will not be shady, thereby maximizing the production value for this part of the site.

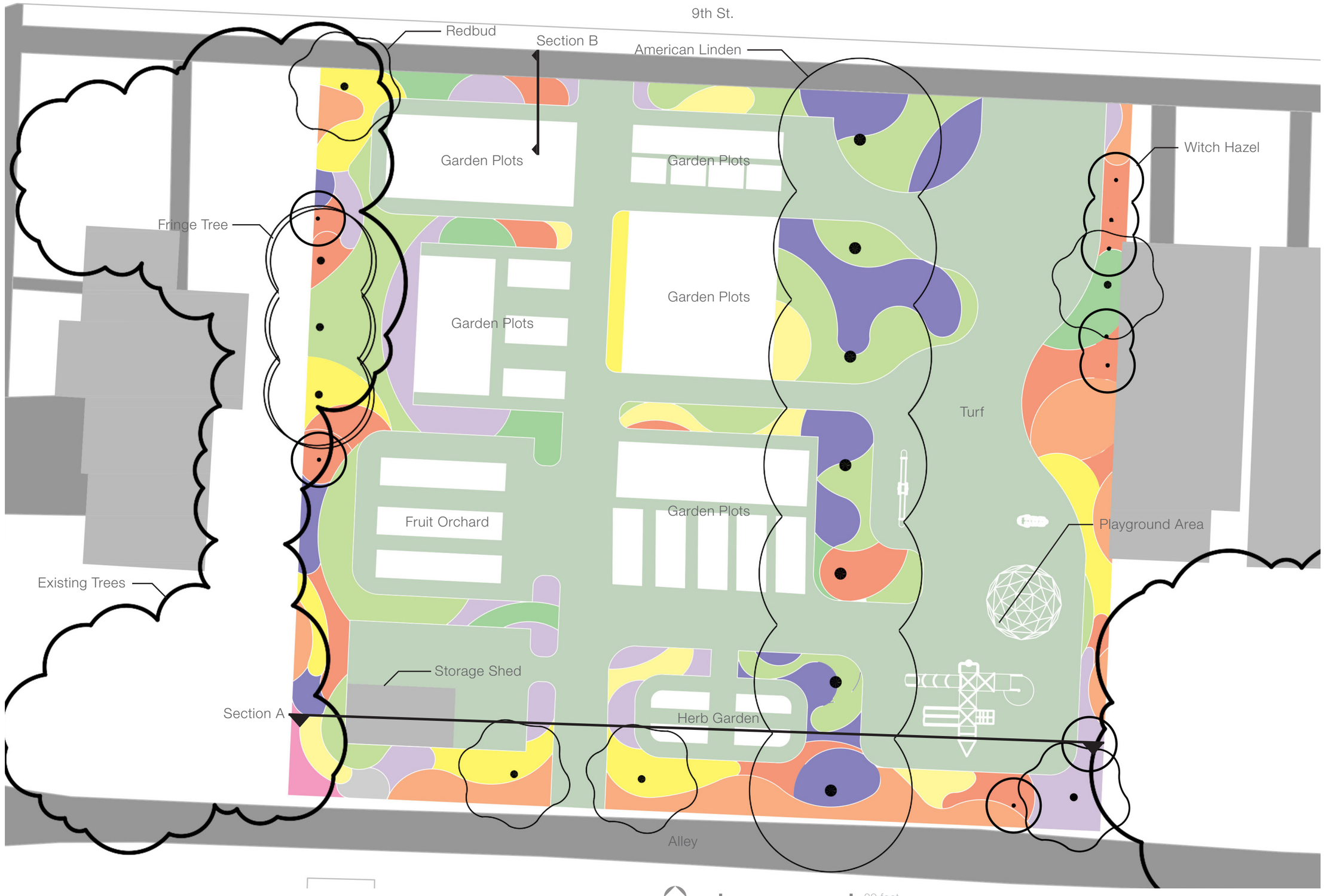


Figure 5.12 - Food & Fun planting plan

Figure 5.13 - Section A sightlines & planting arrangement

Figure 5.14 - Section B sightlines and planting arrangement

Figure 5.15 - Alley entrance to Food & Fun community gardens in Lykins

Figure 5.16 - Children playing next to Food & Fun community gardens

Site 3 – Social Hub

Inventory & Analysis

Site 3, located at 5415 E. 11th St. in the Sheffield neighborhood, was chosen for further design because it is one of the few larger lots with that has mature trees on the site (Figure 5.18). Large trees allow for this site to be used for social events since the shade makes it much more comfortable to occupy compared to many other lots. This site is moderately accessible; however, there may be problems with ADA access since the sidewalks nearby have slopes that are often greater than eight percent. The sidewalk in front of the site is not continuous and has a gap that extends the width of the property. The site can only be accessed from the north side; the east, west, and south sides are fenced off and privately owned. The south side of the site is furthest away from 11th street and is very secluded. This could potentially lead to illicit activities if not properly addressed through design.

Site Design

The design for the event space is unique as it combines elements from both the traditional park space and pocket park space. Large open spaces are present in the design to allow for social events and activities for large groups. These large open spaces are bordered by colorful, cohesive, and complex planting designs that still allow for good visibility throughout the site (Figure 5.17). Plantings were used to subdivide parts of the lot to create a variety of spaces for socializing and sitting (Figure 5.19 & 5.21).

Since the south side of the lot is most secluded the planting designs to the east and to the west allow for visibility from the neighboring lots (Figure 5.20). Good visibility into the site ensures that there are people constantly keeping watch over this space. On the north side of the lot there are low, dense plantings that give the feeling of enclosure and seclusion from the sidewalk and street while maintaining clear sightlines throughout the site (Figure 5.21). The large mature trees currently on the site were all preserved and incorporated into the planting design and used to help create a sense of enclosure and provide shade (Figure 5.22).

Participant Feedback

The second-most discussed keyword topic was trees. Participants appreciate mature trees that provide shade and a peaceful atmosphere in any given site. Mature trees were complemented with preferred planting types that include cohesive color combinations, orderly borders, and a variety of plant types and textures. Mature trees within the property and new ones planted on the north side of the property help break up the large event space so that it does not feel too open or exposed, attributes that were negatively perceived by participants (Figure 5.20). The use of color was implemented specifically in the back of the property to ensure that it draws attention and nearby residents are aware of what is happening in that portion of the site.

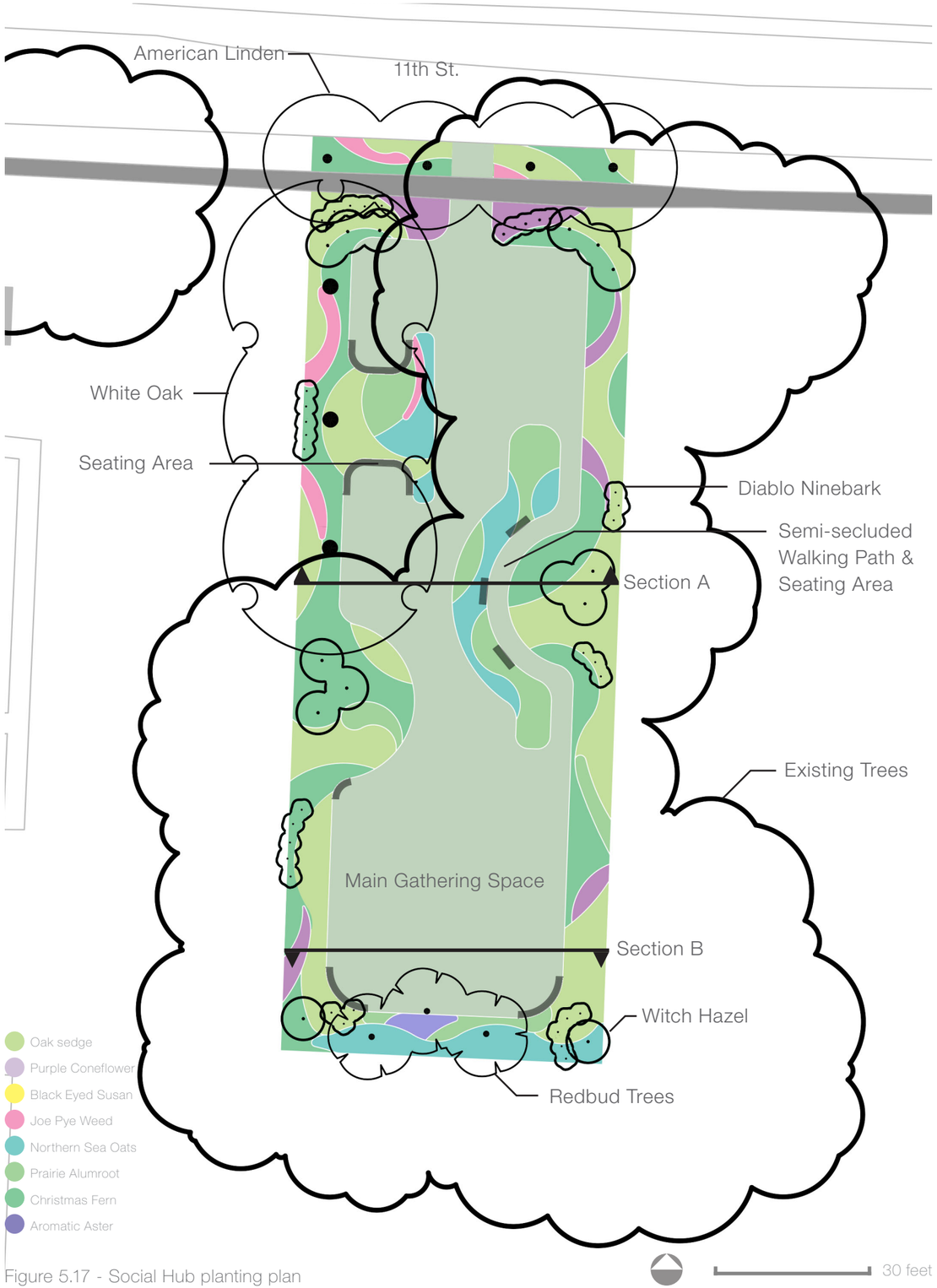


Figure 5.17 - Social Hub planting plan

Figure 5.18 - Social Hub existing site

Site 3 Parcel

40 feet

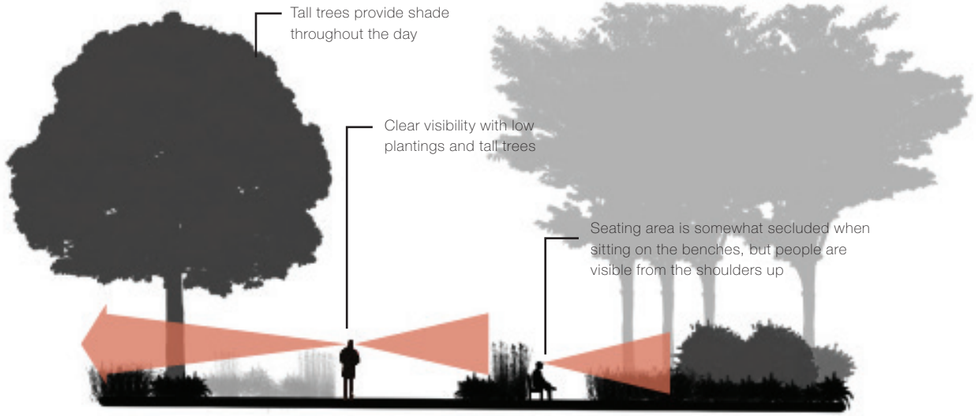


Figure 5.19 - Section A plantings create levels of enclosure

30 feet

Figure 5.20 - Section B of expansive gathering space

30 feet

Figure 5.21 - Entrance to the Social Hub on 11th street with diverse plantings

Figure 5.22 - Main gathering space in Social Hub in Lykins neighborhood

Site 4 – Little Fuller Park

Inventory & Analysis

Site 4, located at 801 Fuller Ave. in Sheffield was classified as a pocket park lot (Figure 5.23). This lot was chosen for design because it is in a low residential neighborhood far from major streets which is different than other pocket park vacant lots. The lot is located on a street corner and is highly visible from every direction. There are sidewalks on the north and west side that connected to the entire surrounding block. There is little vegetation currently on the site besides some turf grass. However, there are some large mature trees on the east property boundary of the site. These large mature trees provide some shade only in the morning hours. The residence to the south has fenced in their property and there is a slight grade change from the privately owned property to the vacant lot. Planting beds were used in the steeper area to mask the grade change and ensure accessibility. Without planting design intervention, the site would be extremely uncomfortable most times of the year.

Site Design

The pocket park is in a low-density residential neighborhood. However, since the site is located at the intersection of two streets, it is highly visible and has good natural surveillance. Shade trees border the streets and allow for a sense of enclosure, privacy, and shade through the entire lot (Figure 5.24). Plantings are short enough to ensure that there is clear visibility across the entire site when standing, but the space feels more private and intimate than other larger lots do.

The pocket park is designed with open areas for small gatherings between residents with plenty of seating for more passive activities (Figure 5.25, 5.26, 5.27 & 5.29). Plantings around sitting areas are colorful, dense and organized, and allow for more seclusion so that those sitting in the space can feel protected (Figure 5.28).

Figure 5.23 - Little Fuller Park existing site

Participant Feedback

Data collected from participants aided in the design process for the pocket park site. More enclosed and mysterious plantings were preferred; however, it was preferred that there was a balance between mystery and coherence. Plantings were orderly and neat but still provided interest for visitors. Passive activities (such as sitting or reading) were highly preferred in a pocket park environment and the plantings reflect that preference with more enclosure and less space for more active activities (such as running or walking) leading to a more peaceful and restful environment (Figure 5.25).

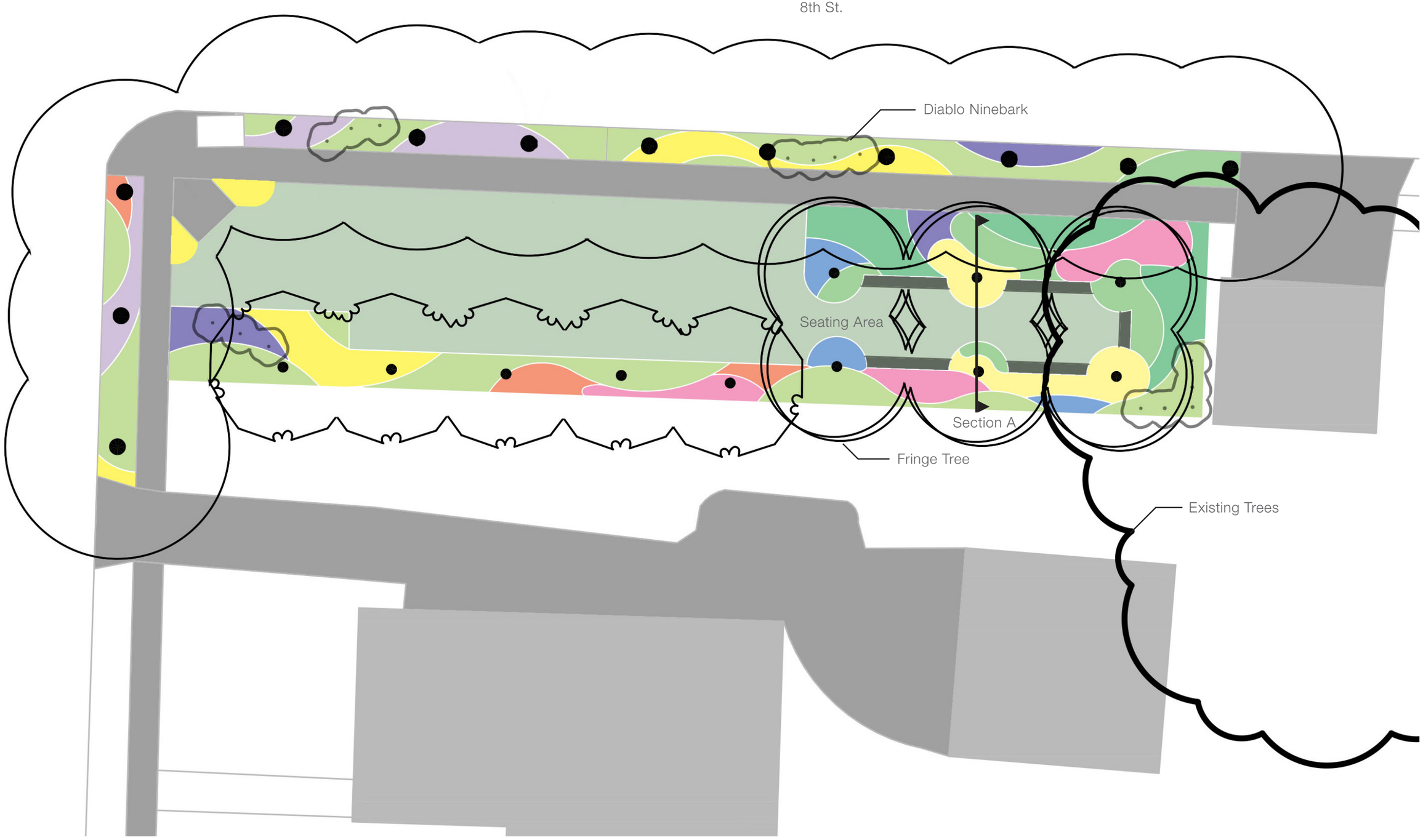


Figure 5.24 - Little Fuller Park planting plan

Figure 5.25 - Seating area surrounded by plantings

Figure 5.26 - Entrance to main lawn of Little Fuller Park

Figure 5.27 - View of the park from the sidewalk

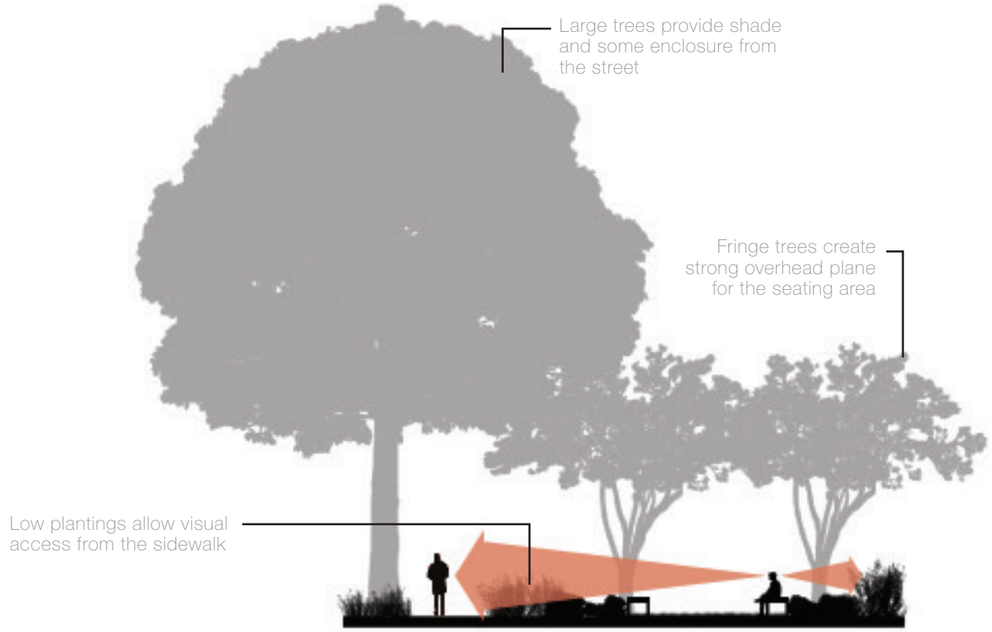


Figure 5.28 - Section A shows enclosure of seating area

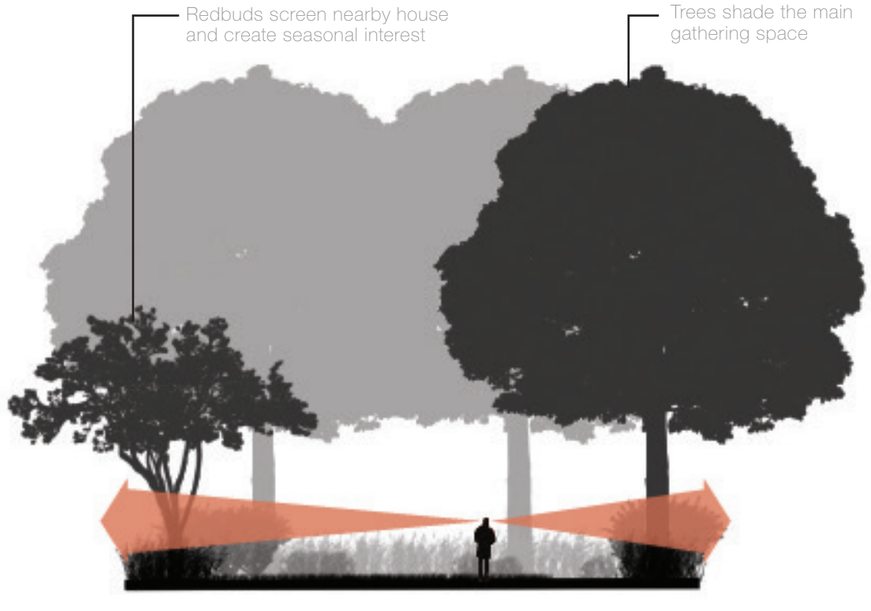
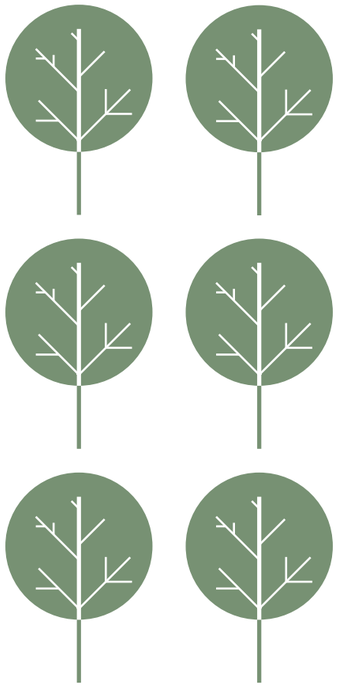
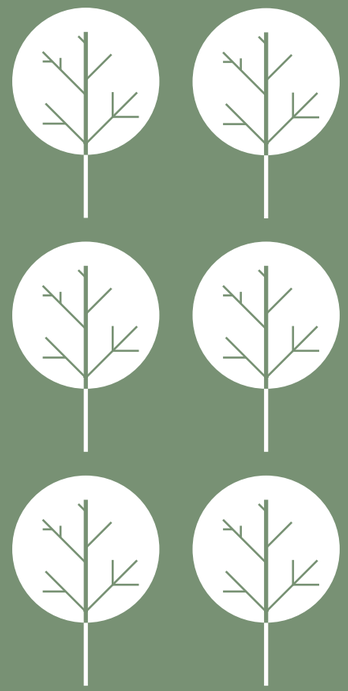


Figure 5.29 - Section B of main gathering space





Conclusions

Conclusion

Contact with nature remains an important aspect of human health. Cities and urban environments could incorporate more green space that is necessary to meet biophilic needs. Green spaces should be designed to maximize their potential benefits. High quality design can increase use patterns and encourage people to spend more time outside.

The designs and research in this report include residents in the design process and incorporates their preferences into the planting designs. Local input improves the quality of these outdoor spaces in high vacancy residential areas which can increase how often the designs are used. Planting designs based on community feedback present a simple and elegant solution to some of the problems plaguing high vacancy urban neighborhoods in Kansas City, Missouri.

This report and its findings will not solve problems of urban vacancy, but it presents a step in the right direction. Historically, urban areas with high vacancy are avoided and struggle to get improved. Small changes, like improving planting designs, could initiate needed change in similar communities.

Reflections & Study Limitations

Outcomes of this study could have a significant impact on how vacant lots are reused in large cities. The flowchart used to assign typologies was created specifically for this research, but with some adaptation it could be used as a reference by planners or landscape architects for specific circumstances other than Kansas City, Missouri. Additionally, while the findings of this study are not statistically significant, it could be used as a guideline and precedent for planners and landscape architects to create reuse strategies and incorporate resident preferences in the design process. Consideration of people's preferences in the process of planting design is a unique application of community engagement. Additionally, applying the Kaplans' preference matrix to the planting design process helps better understand how planting design principles affect preferences.

It should be acknowledged that this study only deals with preference as it relates to planting design, not any other factors. Preference is a broad topic that contains a large body of research that could not all be covered in this study.

Also, there are more planting design principles than what is listed previously, and I have attempted to consolidate these principles so that they correlate best with preference.

Semi-structured interviews are time consuming, during the interview process and subsequent transcription of interviews and data analysis. Additionally, sample sizes with this type of data collection are limited due to time restrictions. Smaller sample sizes in this qualitative research can produce ungeneralizable data and not encompass a good representation of the entire population's preferences.

This study aims for random sampling, but there may be bias since people who participate in interviews may be residents that have close connections with neighborhood associations. Also, demographics can play a significant role in preferences, but this study focuses on preferences as they relate to evolutionary psychology. For example, different ethnic groups may prefer different landscapes due to historical events. Further, preference and place attachment are affected by individual experience, cultural ties, social and physical factors, and the way each person processes their environment (Scannell and Gifford 2010). Since preference is such a broad topic it was necessary to exclude aspects related to demographic variation in order to answer the research questions.

Additionally, collecting data in a coffee shop could exclude some populations. Interview locations could have been held at a community center or church to increase the diversity of participants. Ideally, interviews could have been held at multiple locations to ensure people from across both neighborhoods had an opportunity to participate.

Future Research

This report opens the door for many interesting avenues of research. Since this report was limited in demographic variation of participants, future research could focus on how demographics affect planting design preferences in public space. Another topic of future research could study how comfortable people are using spaces when alone or in a group. My research gathered data from community members only once during interviews. Future research could dive deeper into community-led design and meet with community members more often in order to further refine preferences. Another research path could investigate how socio-economic and cultural factors could effect environmental preferences.

Comprehensive understanding of local needs in urban areas is fundamental to creating high quality outdoor space. Resident preferences are frequently overlooked in the traditional design process. Community participation in the design process could solve many issues of outdoor green space. Detailed design decisions can be supplied by stakeholders and improve the quality of outdoor green space. Landscape architects could act as facilitators to a community driven design-build process instead of the sole designer.

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Appendix A - Figure Bibliography

Figure 2.1 - Kaplan, Rachel, Stephen Kaplan, and Robert L. Ryan. 1998. With People in Mind: Design and Management of Everyday Nature. Scan.

Figure 2.2 - Kaplan, Rachel, Stephen Kaplan, and Robert L. Ryan. 1998. With People in Mind: Design and Management of Everyday Nature. Scan.

Figure 2.3 - Kaplan, Rachel, Stephen Kaplan, and Robert L. Ryan. 1998. With People in Mind: Design and Management of Everyday Nature. Scan.

Figure 2.4 - Kaplan, Rachel, Stephen Kaplan, and Robert L. Ryan. 1998. With People in Mind: Design and Management of Everyday Nature. Scan.

Figure 2.5 - Kaplan, Rachel, Stephen Kaplan, and Robert L. Ryan. 1998. With People in Mind: Design and Management of Everyday Nature. Scan.

Figure 2.8 - Weinberg, Haley. 2019. Signs of Neglect in a Vacant Lot. Photograph.

Figure 3.2 - Weinberg, Haley. 2019. Vacant lot in a neighborhood setting. Photograph.

Figure 3.3 - Chesney, Paden. 2019. Large vacant field. Photograph.

Figure 3.4 - Weinberg, Haley. 2019. Overgrown residential lot. Photograph.

Figure 3.5 - Weinberg, Haley. 2019. Small lot between two houses. Photograph.

Figure 3.10 - Woods, Jonathan. 2016. Interview Location at Eleos Coffee. Photograph. https://www.google.com/maps/v?hl=en&pb=!1s0x87c0faf533c8d29d%3A0x841ab5094fb62e99!3m1!7e115!4shttps%3A%2F%2Flh5.googleusercontent.com%2Fp%2FAF1QipNJ01TAxwNNLpaDEtFJfl_44Z_XkPqFy1xtJ1UU%3Dw284-h160-k-no!5seleos%20coffee%20house%20kansas%20city%20mo%20-%20Google%20Search!15sCAQ&imagekey=!1e10!2sAF1QipNJ01TAxwNNLpaDEtFJfl_44Z_XkPqFy1xtJ1UU&sa=X&ved=2ahUKEwih8821sbHoAhXEk60KHe9LD9oQoiowC3oECBkQBg.

Appendix B - Glossary of Terms

Vacant lot – a lot or land parcel that was once occupied or used, but now has no occupants or used. Typically neglected and shows evidence of previous use but is in a dilapidated and unappealing conditions.

Planting design – the use of plant materials (trees, shrubs, perennials, annuals, etc.) to create a cohesive landscape that is inviting and enjoyable to users.

Preferences – personal likes and dislikes that influences everyday decisions.

Disinvestment – a withdrawal of attention, funding, and priority that communities face due to poor social or economic factors.

Outdoor space – public spaces that anyone has access to that allow for social, recreational, or personal use.

Green space – outdoor spaces that use vegetation to create a more livable, enjoyable environment.

Urban space – outdoor spaces that located in cities or other highly populated areas.

Appendix C - IRB Exemption

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Dr. Sara Hadavi
Landscape Architecture/Regional and Community Planning
1096 Seaton Hall

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 02/04/2020

RE: Proposal #10005.1, entitled "Plantings with People in Mind: Increasing use in urban vacant lots through planting design."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #10005, ENTITLED, "Plantings with People in Mind: Increasing use in urban vacant lots through planting design"

The Committee on Research Involving Human Subjects at Kansas State University has approved the proposal identified above as a minor modification of a previously approved proposal, and has determined that it is exempt from further review. This exemption applies only to the most recent proposal currently on file with the IRB. Any additional changes affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Unanticipated adverse events or problems involving risk to subjects or to others must be reported immediately to the IRB Chair, and / or the URCO.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of changes in your project that affects the use of human subjects.

203 Fairchild Hall, Lower Mezzanine, 1601 Vattier St., Manhattan, KS 66506-1103 | 785-532-3224 | fax: 785-532-3278
comply@k-state.edu | k-state.edu/comply

Appendix D - Semi Structured Interview

Introduction

- Inform participant of recording device
- Inform participant of the structure of the interview
    - Rating of 20 photographs (5 sets of 4)
    - Talking about ratings

Photo Ratings

- Show them first set of photos
- Ask them to rate the photos from 1 to 4. 1 being most likely to visit and 4 being least likely to visit
- Preference Framework questions
    - Which of these four images do you think easiest to understand?
    - Which of these four images do you think is the most distinct and memorable?
    - Which of these four images do you think has the most variety?
    - Which of these four images would you like to explore more if you visited it?
- Record participants choices
- Repeat steps a-c for the other 4 sets of photos.

Rating Conversation

- Starting with the first image set, ask them to talk about their highest rated photo
    - What aspects of the image did you like?
    - How do you see yourself using this space?
    - Continue to guide conversation to reveal specific factors that influenced their decision
- Repeat for each highest rated photo
- Starting with the first image set, ask them to talk about their lowest rated photo
    - What aspects made this image less appealing?
    - Is this space inviting? Why or why not?
    - How do you see yourself using this space?

Conclusion

- Thank them for their time
- Give them gift card incentive

Images Response Sheet

Please use this sheet to record your preferences for each set of images you will be shown. Each set of images will be listed as A - D. Rate your preference for each image on a scale of 1 - 4. 1 being the most preferred and 4 being the least preferred. Then select the image that best fits the following questions.

Image Set 1

A: _____ A / B / C / D - Which image is most organized and understandable?
B: _____ A / B / C / D - Which image is most interesting and has the most variety?
C: _____ A / B / C / D - Which image is most distinct and memorable?
D: _____ A / B / C / D - Which image are you most likely to explore and look around in?

Image Set 2

A: _____ A / B / C / D - Which image is most organized and understandable?
B: _____ A / B / C / D - Which image is most interesting and has the most variety?
C: _____ A / B / C / D - Which image is most distinct and memorable?
D: _____ A / B / C / D - Which image are you most likely to explore and look around in?

Image Set 3

A: _____ A / B / C / D - Which image is most organized and understandable?
B: _____ A / B / C / D - Which image is most interesting and has the most variety?
C: _____ A / B / C / D - Which image is most distinct and memorable?
D: _____ A / B / C / D - Which image are you most likely to explore and look around in?

Image Set 4

A: _____ A / B / C / D - Which image is most organized and understandable?
B: _____ A / B / C / D - Which image is most interesting and has the most variety?
C: _____ A / B / C / D - Which image is most distinct and memorable?
D: _____ A / B / C / D - Which image are you most likely to explore and look around in?

Image Set 5

A: _____ A / B / C / D - Which image is most organized and understandable?
B: _____ A / B / C / D - Which image is most interesting and has the most variety?
C: _____ A / B / C / D - Which image is most distinct and memorable?
D: _____ A / B / C / D - Which image are you most likely to explore and look around in?

Appendix E - Interview Image Sets

Image Set 1 - Event Space

Image 1.A

Image 1.B

Image 1.C

Image 1.D

Image Set 2 - Play Space

Image 2.A

Image 2.B

Image 2.C

Image 2.D

Image Set 3 - Traditional Park Space

Image 3.A

Image 3.B

Image 3.C

Image 3.D

Image Set 4 - Walking Path Space

Image 4.A

Image 4.B

Image 4.C

Image 4.D

Image Set 5 - Pocket Park Space

Image 5.A

Image 5.B

Image 5.C

Image 5.D

Appendix F - Analysis Spreadsheets

Image Ratings

Image		F 1	F 2	M 0	M 4	F 5	M 6	M 7	M 8	M 9	F 10	F 11	F 12	F 13	M 14	F 15	M 16	M 17	M 18	M 19	M 20	F 21	F 22	F 23	M 24	M 25	M 26	Avg. Ratings	Avg. Male Ratings	Avg. Female Ratings
	**Image 1.A**	4	4	2	1	4	3	2	3	4	3	4	4	4	4	2	3	4	4	2	4	1	2	4	4	4	3	**3.2**	2.9	3.6
	**Image 1.B**	2	2	1	2	2	4	4	4	2	4	1	2	3	1	2	2	1	3	1	3	3	2	2	2	2	2	**2.3**	2.3	2.3
	**Image 1.C**	3	3	3	3	2	3	1	3	2	2	1	2	4	4	3	3	4	3	2	4	3	3	3	4	3		**2.8**	2.9	2.7
	**Image 1.D**	1	1	4	4	1	1	1	2	1	1	3	3	1	3	1	1	2	1	2	4	1	1	1	1	1	1	**1.7**	1.9	1.4
	**Image 2.A**	4	4	4	2	4	1	3	1	4	3	3	1	3	1	4	4	4	4	2	2	1	4	4	4	3	2	**2.9**	2.7	3.2
	**Image 2.B**	3	2	3	1	1	3	4	2	3	4	1	3	2	2	3	1	2	3	1	4	2	1	1	3	1	1	**2.2**	2.3	2.1
	**Image 2.C**	2	3	2	3	3	4	2	3	2	1	4	2	1	4	2	2	1	2	3	3	3	3	3	2	4	4	**2.6**	2.7	2.5
	**Image 2.D**	1	1	1	4	2	2	1	4	1	2	2	4	4	3	1	3	3	1	4	1	4	2	2	1	2	3	**2.3**	2.3	2.3
	**Image 3.A**	2	4	3	2	4	1	3	4	4	3	2	3	3	3	4	4	4	4	3	3	3	4	4	4	4	3	**3.2**	3.2	3.3
	**Image 3.B**	3	2	1	1	2	3	1	1	3	2	3	1	1	2	2	1	1	3	1	1	1	2	2	2	1	2	**1.7**	1.6	1.9
	**Image 3.C**	1	3	2	3	3	4	2	3	2	1	1	2	2	4	3	2	2	2	2	2	2	1	1	1	2	4	**2.2**	2.5	1.8
	**Image 3.D**	4	1	4	4	1	2	4	2	1	4	4	4	4	4	1	1	3	3	1	4	4	4	3	3	3	4	**2.8**	2.7	3.0
	**Image 4.A**	4	4	3	3	4	3	1	4	4	3	2	2	4	4	4	4	3	2	2	4	1	4	4	4	4	3	**3.2**	3.2	3.3
	**Image 4.B**	2	2	2	1	3	2	3	2	2	2	3	4	3	2	3	2	2	1	3	3	2	2	3	3	1	1	**2.3**	2.0	2.6
	**Image 4.C**	3	3	1	4	2	1	4	1	1	1	1	3	2	3	2	1	1	4	1	2	3	1	1	1	3	2	**2.0**	2.0	2.0
	**Image 4.D**	1	1	4	2	1	2	2	3	3	4	4	1	1	1	1	3	4	3	4	1	4	3	2	2	2	4	**2.4**	2.7	2.1
	**Image 5.A**	1	4	2	1	4	3	4	3	2	1	3	3	2	1	4	2	3	3	2	1	1	3	2	2	3	3	**2.4**	2.3	2.5
	**Image 5.B**	2	2	1	2	3	2	2	2	1	2	1	4	3	4	1	4	1	2	3	3	2	2	4	4	2	2	**2.3**	2.3	2.4
	**Image 5.C**	4	3	3	3	2	4	3	4	4	3	2	2	4	2	3	1	4	4	1	2	3	4	3	1	4	4	**3.0**	2.9	3.0
	**Image 5.D**	3	1	4	4	1	1	1	1	3	4	4	1	1	3	2	3	2	1	4	4	4	1	1	3	1	1	**2.3**	2.4	2.1

Key:
Image X.A - most coherent rendering
Image X.B - most legible rendering
Image X.C - most complex rendering
Image X.D - most mysterious rendering

Photos rated on a scale of 1-4. 1 being the most preferred and 4 being the least preferred

	Most preferred image in set
	Least preferred image in set
	Most preferred image in set by gender
	Least preferred image in set by gender

Preference Framework Ratings

			Participants																										TOTALS	Ratings per Set	Ratings Overall
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
	**Image 1.A**	C				1							1						1		1	1	1				1		**7**		
		L			1																								**1**		
		Cm																											**0**		
		M			1		1																1						**3**		
	**Image 1.B**	C			1				1																			1	**3**		
		L	1		1									1				1		1	1	1				1			**8**		
		Cm		1	1	1			1				1		1	1	1	1	1	1	1		1	1			1	1	**17**	Most Complex	**Most Complex**
		M			1							1	1		1				1		1								**6**		
	**Image 1.C**	C									1																		**1**		
		L		1							1																		**2**		
		Cm						1	1	1															1				**4**		
		M							1							1									1				**3**		
	**Image 1.D**	C	1	1	1			1		1		1		1	1	1	1	1		1				1	1	1			**15**	Most Coherent	**Most Coherent**
		L				1	1		1	1			1		1	1	1		1				1	1	1		1	1	**14**	Most Legible	**Most Legible**
		Cm	1				1	1					1		1								1						**6**		
		M	1	1		1		1	1	1				1				1		1			1	1	1		1	1	**14**	Most Mysterious	
	**Image 2.A**	C		1	1		1	1			1		1				1		1					1					**9**		
		L		1	1		1									1													**4**		
		Cm																											**0**		
		M				1		1																					**2**		
	**Image 2.B**	C			1	1			1			1		1		1	1			1	1		1					1	**10**	Most Coherent	
		L			1	1		1					1	1	1				1		1	1	1			1	1		**12**	Most Legible	
		Cm												1				1	1					1	1	1		1	**7**		
		M	1		1									1							1		1						**5**		
	**Image 2.C**	C															1												**1**		
		L						1		1							1		1								1		**5**		
		Cm				1	1			1			1		1					1	1	1							**7**		
		M		1								1				1		1	1				1			1	1		**9**		
	**Image 2.D**	C	1						1												1				1	1	1		**6**		
		L	1					1	1							1								1	1				**6**		
		Cm	1	1	1	1		1	1	1			1			1	1			1							1		**12**	Most Complex	
		M			1		1		1		1			1					1				1				1	1	**10**	Most Mysterious	
	**Image 3.A**	C			1		1					1		1						1			1	1	1	1			**9**		
		L																											**0**		
		Cm																											**0**		
		M														1				1									**2**		
	**Image 3.B**	C	1			1	1		1					1		1		1			1	1					1	1	**11**	Most Coherent	
		L				1				1			1	1	1	1				1	1	1	1				1		**11**	Most Legible	
		Cm	1	1		1			1							1			1				1						**7**		
		M	1			1							1	1									1						**5**		
	**Image 3.C**	C		1								1				1													**3**		
		L					1					1							1										**6**		
		Cm	1		1							1		1		1	1	1		1	1	1		1	1	1			**13**	Most Complex	
		M		1	1							1		1															**4**		
	Image 3.D	C							1	1									1										**3**		
		L	1	1		1	1				1	1					1		1									1	**9**		
		Cm			1	1		1	1	1			1														1	1	**7**		
		M				1	1	1	1	1					1	1	1	1	1		1		1	1	1	1	1	1	**16**	Most Mysterious	**Most Mysterious**
	**Image 4.A**	C		1						1	1	1						1	1						1		1	**8**	Most Coherent	
		L	1																									**1**		
		Cm																									1	**1**		
		M	1										1						1								1	**4**		
	**Image 4.B**	C			1		1										1						1	1				**5**		
		L			1									1					1		1		1				1	1	**7**		
		Cm			1							1							1		1		1				1		**6**		
		M			1									1											1				**3**		
	**Image 4.C**	C	1	1					1	1	1													1					**6**		
		L							1	1	1			1										1		1			**6**		
		Cm	1		1		1		1	1	1							1	1	1		1		1	1	1			**14**	Most Complex	
		M			1		1		1	1	1							1			1	1				1			**9**	*Most Mysterious*	
	**Image 4.D**	C				1	1									1	1		1			1					1		**7**		
		L	1	1		1	1	1				1				1	1	1		1		1			1				**12**	Most Legible	
		Cm	1			1							1	1	1	1													**6**		
		M	1			1	1							1	1	1							1		1		1		**9**	*Most Mysterious*	
	**Image 5.A**	C	1		1		1			1				1			1	1	1	1		1				1			**11**	Most Coherent	
		L	1													1		1			1	1							**5**		
		Cm																											**0**		
		M	1		1		1					1																	**4**		
	**Image 5.B**	C			1	1			1	1						1						1						1	**7**		
		L			1				1	1		1				1		1		1							1	1	**9**		
		Cm		1	1		1	1				1					1		1		1	1					1	1	**11**	*Most Complex*	
		M		1					1	1																		1	**4**		
	**Image 5.C**	C									1																		**1**		
		L																											**0**		
		Cm												1										1	1	1			**4**		
		M										1					1			1									**3**		
	**Image 5.D**	C	1				1							1		1								1	1		1		**7**		
		L	1	1		1	1	1		1		1		1	1				1					1	1	1			**12**	Most Legible	
		Cm	1	1		1	1		1	1			1		1	1	1	1		1									**11**	*Most Complex*	
		M		1		1		1						1	1	1	1		1	1		1	1	1	1	1	1		**15**	Most Mysterious	

Key:
C = Coherent
L = Legible
Cm = Complex
M = Mysterious

Image X.A - most coherent rendering
Image X.B - most legible rendering
Image X.C - most complex rendering
Image X.D - most mysterious rendering

Favorite image in set

Ratings Analysis

	Avg. Ratings	Ratings per Set	Ratings Overall
	**Image 1.A**	**3.2**		
	**Image 1.B**	**2.3**	Most Complex	**Most Complex**
	**Image 1.C**	**2.8**		
	**Image 1.D**	**1.7**	Most Coherent Most Legible Most Mysterious	**Most Coherent** **Most Legible**
	**Image 2.A**	**2.9**		
	**Image 2.B**	**2.2**	Most Coherent Most Legible	
	**Image 2.C**	**2.6**		
	**Image 2.D**	**2.3**	Most Complex Most Mysterious	
	**Image 3.A**	**3.2**		
	**Image 3.B**	**1.7**	Most Coherent Most Legible	
	**Image 3.C**	**2.2**	Most Complex	
	**Image 3.D**	**2.8**	Most Mysterious	**Most Mysterious**
	**Image 4.A**	**3.2**	Most Coherent	
	**Image 4.B**	**2.3**		
	**Image 4.C**	**2.0**	Most Complex *Most Mysterious*	
	**Image 4.D**	**2.4**	Most Legible *Most Mysterious*	
	**Image 5.A**	**2.4**	Most Coherent	
	**Image 5.B**	**2.35**	*Most Complex*	
	**Image 5.C**	**3.0**		
	**Image 5.D**	**2.3**	Most Legible *Most Complex* Most Mysterious	

Favorite Photo Framework Rating count
Coherence - 3
Legibility - 4
Complexity - 2
Mystery - 3

Favorite image in set
Least favorite image in set

Key Words By Image (w/ subtopics)

Author Ratings	Pref. Score	Image		Plantings: Color	Plantings: Trees	Plantings: Bushes/Shrubs	Plantings: Flowers	Plantings: Visual Quality	Plantings: Plant Quantity	Spatial Arrangement: Open	Spatial Arrangement: Enclosure	Spatial Arrangement: Visibility	Spatial Arrangement: Organization	Emotive Terms: Safety	Emotive Terms: Comfort	Environmental factors: Temperature	Environmental factors: Light	Activities: Passive	Activities: Active	Activities: Social
COHERENCE																				
1/5	3.2		Image 4.A		(7) trees		(1) flowers – 4 (5) flowers	(1) garden (2) dying grass (5) distracting (16) boring	(8) lack of variety (9) lack of variety (11) least vegetation (23) lack of vegetation	(21) open (25) too open (26) exposed		(21) good visibility (1) visibility	(1) balance (5) unorganized (13) lack of depth (21) unkempt (5) unkempt -2			(2) dry (16) hot (23) hot and sunny	(5) lack of shade (13) lack of shade (15) lack of shade (15) lack of shade (22) no shade (23) no shade – 2 (24) no shade (25) no shade	(1) lack of seating (23) not enough resting places (24) not enough seating	(1) walking (2) walk (13) walking	(13) hang out
2/5	2.9		Image 2.A	(5) cohesive colors (2) lack of color (2) all green (10) lack of color (16) lack of color (16) lack of color (16) lack of color	(5) lack of trees (3) lack of trees (23) lack of trees			(6) inviting (16) plain (18) plain (23) plain (2) boring (2) boring (2) uninteresting (2)plain (5)unappealing	(16) lack of variety	(6) open (8) open -4 (14) open (15) too open (16) too open (23) naked – 3	(23) lack of expansion	(12) visibility (14) visibility	(8) not cluttered	(1) safe	(8) fun		(8) shade (8) less shade (8) sunshine	(6) seating (1) more seating (2) wouldn't stay (2) lack of activities	(8) frisbee (8) play ball	
3/5	3.2		Image 3.A	(8) cohesive colors (8) lack of color variety (16) lack of color (17) lack of color	(16) trees boring (18) too few trees			(5) boring plantings (24) plain (8) boring (17) not welcoming – 2 (23) boring	(9) lack of variety	(15) too open (17) open	(18) lack of enclosure	(2) too visible	(16) lack of foreground (23) no unity (24) too repetitive		(8) fun		(24) good shade			
4/5	3.2		Image 1.A	(20) greenery (11) lack of color (12) lack of color (24) no color variety (2) Least colorful	(2) no flowering trees	(22) hedges	(2) no flowers	(4) natural (26) public park (16) plain (18) plain (5) boring (8) boring (13) bland (17) not distinct (24) boring	(8) lack of variety (11) lack of variety (13) lack of diversity – 2 (16) lack of variety	(6) open -3 (20) spacious – 4 (2) unsecure (2) highly accessible (16) too open (24) open	(19) closed off		(17) organized -2 (20) trimmed (13) too balanced (23) not cohesive (12) repetitive (17) repetitious		(1) uncomfortable (23) austere	(1) hot (1) hot (1) humid (1) hotter (1) hot	(13) lack of shade		(2) walk	
5/5	2.4		Image 5.A	(20) greenery (7) monotonous color	(4) white trees	(1) bushes	(4) white flowers	(20) impeccable (23) interesting (21) beautiful (2)attractive (2) dull (5) dull	(5) not complex (7) lack of variety	(10) clean (15) open (14) open (26) open (21) spacious (2) too open (2) too organized (7) rule is open (7) too open (16) too open	(1) exposed	(1) See (1) visibility	(7) organized (10) organized -2 (21) organized (10) trimmed -2	(2) safe -2	(1) peaceful			(2) sit (20) sit (20) drink coffe (2) drive by	(1) walk	
LEGIBILITY																				
1/5	2.2		Image 2.B	(4) colorful trees (5) different colors (5) different colors (7) color (16) color (16) color variety (20) color (22) vibrant yellow (23) color	(6) tree (23) ornamental trees		(12) lack of flowers – 2	(5) appealing (16) draws eye (26) inviting (16) welcoming	(26) variety (7) lack of variety (23) lack of variety	(26) open		(11) visibility	(11) not cluttered (11) organized (7) too busy				(23) shade			
2/5	2.3		Image 5.B	(11) color (15) color (17) color (14) tree color	(17)conifer trees (15) redbuds (15) redbuds (23) spruce trees	(9) bushes		(3) interesting (23) too much contrast	(3) diversity	(3) open (8) open space – 2 (16) too open			(11) repetition (23) clean (23) balance (23) not cohesive (24) symmetrical		(17) warm atmosphere	(16) hot	(12) SHADE – 2 (24) lack of shade (16) lack of shade	(17) sit (15) sit	(12) grill (12) cook	(9) party – 2
3/5	2.3		Image 1.B	(3) color (3) color (11) color (14) color (17) color (17) color (19) color (8) clashing colors	(19) flowering trees	(19) bushes		(10) boring	(3) diversity – 3 (14) variety (17) variety	(14) open (8) less enclosed (8) shallow (19) too open		(11) visibility	(6) cluttered (8) overgrowth		(11) happier (13) not calming		(11) brighter			(11) socializing
4/5	2.3		Image 4.B	(5) clashing colors	(26) cedar trees			(18) clean (8) junky	(26) variety	(6) open -2 (25) gathering space			(18) organized (6) well kept (18) less jungle-like			(12) too sunny	(23) shade – 4	(23) sit	(4) explore	
5/5	1.7		Image 3.B	(8) color (8) color (8) color (13) color (13) color (16) color (16) color (17) color (19) color (21) color (23) color	(3) trees (1) tree (8) trees (8) trees (13) evergreens (13) flowering trees (17) distinct tree	(3) bushes (16) shrubs		(7) contrast (7) welcoming (16) welcoming (17) welcoming (21) attractive	(3) diversity (7) variation -2 (13) variation (19) variety	(6) open (6) open – 2 (12) open (16) open (17) open – 2 (19) open (25) spacious – 2 (26) open	(8) privacy fence	(12) visibility	(7) size change (7) proportion (16) organized (19) balance (21) plain (19) manicured			(8) sunlight	(17) shade	(12) sit – 2 (13) birdwatch – 2	(12) walk (7) hang out	
COMPLEXITY																				
1/5	2.6		Image 2.C	(13) variety of color (17) color (17) color (6) clashing colors	(10) trees (10) trees (13) trees (13) trees		(10) flowers – 2 (13) wildflowers – 2 (13) flowers (17) flowers (21) flowers	(13)variety of texture (10) inviting -2 (6) overgrown (6) uncared for (11) mow strip (14) mow strip (25) overgrown (26) overgrown (6) overgrown (8) dirty	(17) variety	(17) open			(18) plant placement		(10) comforting		(21) shade		(13) Look at butterflies (13) explore (13) look at flowers	
2/5	2.2		Image 3.C	(11) color (22) color (23) color (23) colors (6) clashing colors	(1) tree (24) trees (24) trees		(10) flowers (23) wildflowers (23) perennials (24) flowers (14) messy flowers	(1) foliage (23) vegetation (23) wildness (26) wild (23) overgrown	(1) variety (24) variety	(10) large area (24) open	(24) secluded	(11) visibility – 2	(18) trimmed (23) coherent unity (23) artistic balance (23) organized (24) asymmetrical (26) unorganized	(1) safe – 2 (11) safe	(1) peaceful			(7) sit – 2 (10) sit	(1) walking (10) walk	
3/5	2.8		Image 1.C	(12) color (15) complimentary colors (14) poor color combinations	(8) background trees (8) trees (8) trees (15) lack of trees			(14) mow strip (16) plain	(26) lack of variety (21) too many plants	(8) open – 3 (12) open (21) poor visibility		(8) visibility (12) visibility	(21) cluttered (26) disorganized					(8) sitting (12) sit		
4/5	3.0		Image 5.C	(13) lack of color (17) lack of color	(25) too little trees	(18) bushes – 2		(6)junky (8) wild plantings (8) boring (8) unattractive (22) looks like restaurant	(13) variety (16) variety (19) variety – 2 (24) variety (6) too much variety (9) more plantings needed (17) lack of variety	(19) open – 2 (24) open – 2 (17) too exposed to neighbors (17) open – 2 (25) too open	(16) some privacy (7) secluded		(16) orderly (6) not organized (13) asymmetrical (26) asymmetrical	(1) unsafe	(16) comfortable		(16) shade (24) shade		(17) event	
5/5	2.0		Image 4.C	(10) good color (19) variety of color (22) colors	(8) trees (8) trees (8) trees (8) trees (11) trees (16) tree (22) trees		(8) wildflowers (10) flowers (19) wildflower (19) wildflower	(7) distinctive (17) garden (8) inviting (10) inviting	(2) diversity (6) variety (8) variety – 2 (11) variety (19) variety (17) variety (22) variety	(6) openness (6) openness (10) open (19) open		(11) visibility (4) blocked views	(8) order (11) repetition (23) unity (23) balance (18) unorganized		(8) comfortable (10) calming		(8) shading (19) shade (19) shady (22) shade (24) shade	(8) sitting place (8) sit (8) eat lunch (8) read (19) sit (24) seating	(7) running (8) explore	(19) hand out

Key Words By Image (w/ subtopics)

Author Ratings	Pref. Score	Image			Plantings						Spatial Arrangement				Emotive Terms		Environmental factors		Activities		
					Color	Trees	Bushes/Shrubs	Flowers	Visual Quality	Plant Quantity	Open	Enclosure	Visibility	Organization	Safety	Comfort	Temperature	Light	Passive	Active	Social
COHERENCE																					
MYSTERY																					
1/5	2.4		Image 4.D	+		(1) trees (1) trees (1) trees (2) trees (5) trees (6) trees (14) trees (14) trees (20) trees (7) trees (7) trees		(13) flowers (5) wildflowers	(5) welcoming (5) mysterious -2 (5) appealing (20) stands out	(1) plants (1) plant diversity (13) plant diversity		(7) secluded (7) privacy (13) secluded		(2) line of trees (4) line of trees (13) planned (17) line of trees (19) crowded		(5) romantic		(12) shaded (12) sunny (13) shade (13) sun	(13) lay out (15) sit	(2) walking through (12) explore - 2 (13) walk around (13) explore (14) walk through trees (17) explore (17) running	
				-		(3) too many trees (10) too many trees (10) too many trees (11) too many trees (11) too many trees			(21) jungle like (26) unkept (26) not maintained	(11) lack of variety			(3) places to hide (10) blocked views (21) poor visibility	(3) uniform (19) cluttered (21) clutter (17) repetitious -2					(1) lack of seating		
2/5	2.3		Image 2.D	+	(6) color (24) color	(2) evergreens (7) tree (7) tree (9) tree (15) tree (18) more trees		(2) flowers	(1) plants - 4 (3) visually appealing (20) Mow strip (9) beautiful	(3) diversity		(15) hidden (24) secluded		(20) maintained (20) trimmed	(1) safe (1) safe (1) safe (1) safe (24) safe	(1) peaceful - 5 (2) fun	(1) cool	(9) shade - 2 (1) shade	(1) sit -2 (9) sit (9) relax (2) feel plants (2) take pictures - 2 (2) picnic	(1) kick play	
				-		(4) cedar tree			(12) overgrown (13) more strip (19) overgrown - 2	(21) too many plants		(4) too secluded (9) guarded (9) hidden	(21) poor visibility - 2 (15) hidden	(8) cluttered - 2 (21) cluttered	(2) unsafe			(4) darker (12) too shady		(4) drive past	
3/5	1.7		Image 1.D	+	(6) green	(24) trees (26) Canopy (23) trees (16) trees (16) lots of trees (13) tree (13)evergreens (7) trees in front (10) trees (6) Big trees -3 (1) trees (3) tree - 2 (2) evergreen (1) trees	(1) bushes (2) shrubs (2)lowwoods (2)shrubs (13) bushes (16) shrubs		(23) garden (23) life (23) natural (18) garden (21) natural (5) vibrant (5) vibrant (5) lush (13) texture (2) pretty (10) inviting (23) inviting (23) inviting (26) inviting	(6) variety (1) plants	(6) shapely (6) open space (21) open (25) open	(2) sheltered (2) secluded (2) separate (7) seclusion (10) secluded (15) secluded (13) separate spaces (13) privacy - 2 (13) blocked views (16) secluded (16) private - 2 (22) secret (22) isolated (22) private - 2 (24) secluded (24) private - 2		(21) organized (10) trimmed - 2		(6) comfortable - 2 (10) calming (1) comfortable (1) peaceful (1) peaceful (10) peaceful (1) peaceful (23) peaceful	(1) cooler (16) hot - 2	(1) shade (2) light (2) shade (13) shade - 2 (16) shade - 2 (26) shade (25) shade	(1) watch the rain (1) study (1) coloring (1) Bible studies (1) coloring (1) sit (6) sit (6) coffee (9) reading (10) sit (10) drink coffee (15) sit (18) go outside (23) rest (25) check out (25) shelter	(5) climb trees	(5) dinner parties (9) church revival
				-	(6) lack of color				(6) lack of contrast	(2) too many trees - 3 (23) lack of variety	(20) lack of space	(4) secluded		(23) cluttered		(23) claustrophobic		(1) too much shade (4) dark -2			
4/5	2.3		Image 5.D	+	(6) green	(2) trees - 2 (6) trees (6) trees (13) trees (18) trees (22) treesf (26) trees (21) trees	(5) bushes	(13) wildflowers (22) wildflowers	(13) garden (7) inviting (13) beautiful (13) welcoming (5) useful	(7) repetition of trees		(2) private - 2 (2) screened views (5) private space (6) secluded (9) barrier (23) private (23) less accessible (23) private (25) secluded (22) private (26) barrier between houses		(6) symmetrical (6) organized - 2 (6) defined edges (9) purposeful plantings				(13) shady (26) shade (23) shade	(2) sitting (5) eat (5) sitting (6) sit (15) sit (13) do homework (13) barbecue		(2) picnic (5) play (5) party (13) hang out -2 (26) visit neighbors
				-		(5) too many trees (10) trees next to road (11) trees along road (23) too many trees					(23) accessibility	(4)too secluded (10) too secluded (19) closed off	(10) blocked views (11) poor visibility (19) poor visibility (21) poor visibility - 2	(3) regimented (3) unnatural arrangement (11) cluttered (22) proximity to houses				(4) dark			
5/5	2.8		Image 3.D	+	(5) green (6) greenery (13) colorful flowers	(2) trees - 4 (2) tall trees (9) trees - 3 (18) trees at front (26) trees	(13) ivy (14) ivy		(5) natural (5) wild (6) livable (12) overgrown	(1) plants (5) variety	(9) open space	(2) secluded (2) private (9) secluded (9) privacy - 2 (9) secluded (18) enclosure (19) private (25) secluded (26) secluded (18) borders - 2	(2) less visible (15) hidden -2 (15) less visible	(5) nest (5) organized (12) crowded (9) trimmed		(5) fun		(9) shading	(1) sit--day (2) sit (15) sit (15) meditate	(5) take dogs (9) walking	(2) date (9) party
				-	(15) too much green	(3) too many trees (21) too many trees			(19) overgrown	(1) too many plants	(20) lack of space	(4) too secluded (15) closed in (13) private - 2	(11) poor visibility (12) poor visibility (13) poor visibility	(3) trees spread out (11) cluttered (1) too much (19) unorganized	(2) boring (13) claustrophobic (21) unattractive	(1) ghost at night - 2		(6) dark		(1) sit - night		

KEY

\+ Positive keywords

\- Negative keywords

Most preferred image in respective set

Author Rating - the scale at which the author designed the image according to a preference matrix category

Plantings

		Color	Trees	Bushes/Shrubs	Flowers	Visual Quality	Plant Quantity
Positive	# of times topic was mentioned	**60**	**88**	**16**	**30**	**64**	**38**
	General conclusions	Liked color variety and greenery	Liked - amount of trees and ornamentals		Liked - colors and variety of wildflowers	Liked scenes that were inviting and natural looking	Liked variety of plant types and textures
Negative	# of times topic was mentioned	**26**	**21**	**1**	**4**	**57**	**27**
	General conclusions	Disliked - lack of color or clashing colors	Disliked - lack of trees or overplanting of trees		Disliked - lack of flowers	Disliked images that were boring and unorganized	Disliked lack of variety and over-repeated elements
Total per Sub-Category		86	109	17	34	121	65

Total per Category

Plantings
432

Spatial Arrangement

Open	Enclosure	Visibility	Organization
61	**55**	**17**	**55**
Liked enough open space for various activities	Liked feeling of seclusion and privacy offered by plantings	Liked being able to see what is going on around you	Liked organized and maintained images
37	**14**	**17**	**40**
Disliked spaces that were too open and unprotected	Disliked images that were too closed off	Disliked obstructed views	Disliked unorganized images
98	69	34	95

Spatial Arrangement
296

Environmental factors

Temperature	Light
5	**41**
	Liked images that had plenty of shade
12	**19**
Disliked images that were too sunny and hot	Disliked images that did not have enough shade
17	60

Environment
77

Emotive Terms

Safety	Comfort
25	**27**
Overall images made participants feel safe	colorful, dense plantings made people comfortable
13	**7**
More mysterious images made some people feel unsafe	exposed, open images make people feel uncomfortable
38	34

Emotive
72

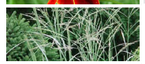
Activities

Passive	Active	Social
62	**31**	**17**
Liked images that had places for passive activities like sitting, reading, eating, etc	Liked images that allow walking and exploring	Liked images that were open enough for social activities, but private enough to offer some protection
8	**3**	**0**
Disliked images with lack of seating		
70	34	17

Activities
121

Appendix G - Plant Palette

Picture	Name	Botannical Name	Type	Size	Light Req.	Water Req.	Foliage Color	Flower
	American Linden	Tilia americana	Deciduous Tree	50’ T 30’ W	Full Sun to Part shade	Medium	Green (Yellow in fall)	Y - insignificant
	White Oak	Quercus alba	Deciduous Tree	50’ T 50’ W	Full Sun	Medium	Green (Yellow in fall)	Y - insignificant
	Armstrong Maple	Acer x freemanii ‘Armstrong’	Deciduous Tree	50’ T 15’ W	Full Sun to Part Shade	Medium to Wet	Green (Red in fall)	Y - insignificant
	Bald Cypress	Taxodium distichum var. distichum	Deciduous Tree	50’ T 20’ W	Full Sun	Medium to Wet	Green (Yellow in fall)	N
	Fringe Tree	Chionanthus virginicus	Deciduous Tree	15’ T 15’ W	Full Sun to Part Shade	Medium	Green	Y - White
	Redbud	Cercis canadensis	Deciduous Tree	20’ T 25’ W	Full Sun to Part Shade	Meduim	Green	Y - Pink
	Forest Pansy Redbud	Cercis canadensis ‘Forest Pansy’	Deciduous Tree	20’ T 25’ W	Full Sun to Part Shade	Meduim	Red and Green	Y -Pink
	Diablo Ninebark	Physocarpus opulifolius ‘Diablo’	Deciduous Shrub	5’ T 5’ W	Full Sun to Part Shade	Dry to Medium	Reddish Green	Y - Pinkish White
	Witch Hazel	Hamamelis virginiana	Deciduous Shrub	10’ T 10’ W	Full Sun to Part Shade	Medium	Green (Yellow in Fall)	Y - Yellow
	Christmas Fern	Polystichum acrostichoides	Perennial	1.5’ T 1.5’ W	Part Shade to Full Shade	Dry to Medium	Green	N
	Purple Coneflower	Echinacea purpurea	Perennial	3’ T 2’ W	Full Sun to Part Shade	Dry to Medium	Green	Y - Purple/ Pink
	Blazing Star	Liatris spicata	Perennial	3’ T 1.5’ W	Full Sun	Medium	Green	Y - Purple
	Black-Eyed Susan	Rudbeckia hirta	Perennial	2’ T 2’ W	Full Sun	Medium	Green	Y - Yellow
	Aromatic Aster	Symphyotrichum oblongifolium	Perennial	3’ T 3’ W	Full Sun	Dry to Medium	Green	Y - Blue/ Purple
	Field Pussytoes	Antennaria neglecta	Perennial	1’ T 1’ W	Full Sun to Part Shade	Dry to Medium	Silvery Green	Y - White
	Tall Boneset	Eupatorium altissimum	Perennial	4’ T 3’ W	Full Sun to Part Shade	Dry to Medium	Green	Y - White
	Joe Pye Weed	Eutrochium purpureum	Perennial	5’ T 3’ W	Full Sun to Part Shade	Medium	Green	Y - Pink
	Clustered Mountain Mint	Pycnanthemum muticum	Perennial	2’ T 2’ W	Full Sun to Part Shade	Medium	Silvery Green	Y - Pink
	Prairie Alumroot	Huechera richardsonii	Perennial	2’ T 1.5’ W	Full Sun to Part Shade	Dry to Medium	Green	Y - Green
	Yarrow	Achillea millefolium	Perennial	3’ T 3’ W	Full Sun	Dry to Medium	Green	Y - Yellow, White, Red

Picture	Name	Botannical Name	Type	Size	Light Req.	Water Req.	Foliage Color	Flower
	Wild Nodding Onion	Allium cernuum	Perennial	1.5’ T 0.5’ W	Full Sun to Part Shade	Dry to Medium	Green	Y - Pink
	Mexican Hat	Retibida columnifera	Perennial	2’ T 1.5’ W	Full Sun	Dry to Medium	Green	Y - Yellow/ Red
	Switchgrass	Panicum virgatum	Grass	5’ T 3’ W	Full Sun to Part Shade	Medium to Wet	Green	Y - Tan/Pink
	Indiangrass	Sorghastrum nutans	Grass	3’ T 2’ W	Full Sun	Dry to Medium	Green	Y - Light Brown
	Oak Sedge	Carex albicans	Sedge	1.5’ T 1.5’ W	Part Shade to Full Shade	Medium	Green	Y - White/ Brown
	River Oats	Chasmanthium latifolium	Grass	2-3’ T 2’ W	Full Sun to Part Shade	Medium to Wet	Green	Y - Green

All plant palette images from:

“Missouri Botanical Garden.” n.d. Accessed March 23, 2020. http://www.missouribotanicalgarden.org/.