

PLAYGROUND UTILIZATION:
A Study on Urban, Community and Neighborhood Park Playgrounds in Manhattan, Kansas

by

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A REPORT

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Abstract

Children's play is partially satisfied through provision of public playgrounds with manufactured playground equipment in urban settings in the U.S., however, manufactured playground equipment is often criticized for its monotonous play equipment and is considered to be the primary cause of low playground utilization and dissatisfaction by many researchers (Hart, 2002; Beckwith, 2000; Cunningham & Jones, 1999; Davies, 1996; Masters, 2011). This study selected an urban park playground, a community playground, and a neighborhood park playground with manufactured equipment in the city of Manhattan as study sites. The purpose of this study is to examine utilization of the current playground areas and equipment —specifically by examining playground satisfaction levels and utilization frequency, and playground equipment satisfaction and utilization frequency to reveal playground utilization issues. A playground field audit and an on-site visitor survey were used to collect data. This study found (a) study playgrounds are underutilized among 6-to-10 and 11-to-15 age groups, (b) correlations exist between play equipment utilization frequencies and satisfaction ratings for most play equipment, and (c) no correlation exists between playground utilization frequency and playground satisfaction ratings. Results also revealed that (d) rare and occasional playground visitors are more likely to be attracted to play equipment with moving parts, higher physical challenges, and creative designs. Playground utilization rates are at current levels partially due to the rigid demand for playground use and play equipment. Although this study showed that 57% of survey participants were satisfied with the manufactured play equipment overall, play equipment should still be carefully selected and installed in consideration of different age groups, and visitors' needs and characteristics; and more creative and cutting-edge play equipment should be considered for future playground improvements.

Glossary

1. **Play equipment:** also known as playground equipment or a composite structure that provides play activities for children (CPSC, 2014; National Recreation and Park Association, 2012).
2. **Structured play:** play that happens in physical education, or organized sports or games (Cardon, Labarque, Smits, & De Bourdeaudhuij, 2009).
3. **School-Age Children:** children 5 years of age through 12 years of age (CPSC, 2014).
4. **Playground utilization:** for playgrounds, the term means the number of people using a playground in a period of time of a playground observation; for individual playground visitors, the term means the number of playground visitations of each playground visitor in a period of time, which could also be called playground visitation frequency, playground utilization frequency or playground visitation frequency (Colabianchi, Maslow, & Swayampakala, 2011).
5. **Playground visitation frequency:** term is used in this paper to refer to the number of times of playground visitation by an individual playground visitor; it is also called playground utilization frequency.
6. **Play equipment utilization frequency:** a categorical frequency of play equipment utilization in a playground visitation (Nixon, 2003).
7. **Sharable play equipment:** a play equipment that can be used by more than one child — for example, a belt swing is not a sharable play equipment; a sand box is a sharable play equipment.
8. **Child capacity:** term refers to the maximum number of children that can play on a play equipment; usually, two children are allowed to play on each sharable play equipment.

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CHAPTER 1 INTRODUCTION

1 BACKGROUND

Playgrounds provide play opportunities for children living in urban environments where play is too dangerous to happen in city streets. Playgrounds have evolved over 130 years. Since the introduction of the first playground in Boston, Massachusetts in 1885, the fixed equipment design began to take its form and continued to dominate playgrounds in the U.S. In the 1960s and 1970s, it was argued that the playgrounds should be more than the a collection of static play equipment and ought to provide opportunities for children's adventures, free play, and imaginative pretend play (Arvid, 1973; Cooper, 1970; Solomon, 2014). However, these ideas didn't go far during that time period (Matthews, 1985).

Today, manufactured playground equipment, placed in a patch of cushioned ground in a park, has become the common setup for American playgrounds. Numerous new types of play equipment have been invented and the safety level is being improved every year by playground equipment manufacturers. Now, children could play at cleaner and safer playgrounds with more play equipment (Barbour, 1999; Mott et al., 1997). Despite all those improvements, studies show children are showing less interest in these playgrounds with manufactured play equipment (Cunningham & Jones, 1999; Hart, 2002a; Silver, Giorgio, & Mijanovich, 2014).

2 PROBLEMS

While substantial improvements have been achieved by playgrounds with manufactured play equipment in terms of safety, cleanliness, and convenient modular designs, the needs for child developmental play in the playground have been ignored. Monotonous and standardized design,

and strict industrial safety guidelines reduced design possibilities and creativeness in playground equipment. More importantly, fixed standard play equipment deprives our children of developmental play opportunities (Barbour, 1999; Cunningham & Jones, 1999).

Children are disconnected from the natural environment and its playful elements during their play experience in playground areas. Manufactured equipment also fails to provide any possibilities for children to manipulate loose parts and materials in their play process, which is considered to be a very important aspect of free play (Gray, 2013). Without realizing it, children using playground equipment are actually confined to conduct structured play only, which provides little or no advanced developmental stimuli to them (Beckwith, 2000; Solomon, 2014). Researchers noticed that children show less and less interest in standardized cookie-cutter playgrounds. They argued that standardized playgrounds are actually over-protected and deprive children of play opportunities. Researchers believe that safe cookie-cutter playgrounds contribute to low playground utilization and destroy creative playground innovations (Colabianchi, Maslow, & Swayampakala, 2011; C. H. C. Hart & Sheehan, 1986; R. Hart, 2002; Solomon, 2014; Veitch, Bagley, Ball, & Salmon, 2006).

Playground problems have drawn the attention of mass media. An ongoing poll conducted by the Wall Street Journal online indicates that 81.8% of 1,887 poll participants think that safety measurements applied to manufactured play equipment make playgrounds less fun (WSJ, 2015). Today's playground is no longer as popular as it was 128 years ago when first introduced, yet playgrounds have never been more important than for today's families living in urban environments where children's outdoor play opportunities have become so scarce (Bohn-Goldbaum et al., 2013; A. C. Bundy et al., 2011; Cardon, Cauwenberghe, Labarque, Haerens, &

Bourdeaudhuij, 2008), and children's screen time on electronic devices and television has increased so rapidly (Anderson, Economos, & Must, 2008).

3 SIGNIFICANCE OF THE STUDY

Nevertheless, performance of our playgrounds with manufactured equipment have not been significantly studied by researchers. Without convincing evidence, municipalities will continue to provide the same manufactured equipment that is conveniently available in the market.

Parents' misperception and lack of information on children's play and playground design help strengthen the domination of playgrounds with manufactured equipment (J. Frost, Wortham, & Reifel, 2008).

In academia, many studies still focus on play equipment and children's physical activities. Few address boring playground activities based on fixed equipment design, which is the one of the major causes of low utilization and sedentary behavior at playgrounds (Martínez Vizcaíno et al., 2008; Rung, et al., 2011).

This playground utilization study, however, looks at the history and evolution of playgrounds in the U.S., and includes an extensive literature review and empirical investigations through direct observations, with the goal of gaining valuable insight for promotion of playground utilization.

4 RESEARCH QUESTIONS

Manufactured equipment at our playgrounds has critics and supporters. Playground utilization has become a hot debate topic in academia and the general public. The research questions presented are as follows: **1) Is there correlation between playground utilization frequency**

and its satisfaction rating under current playground provisions? 2) How does individual play equipment affect playground utilization? 3) What are the differences in utilization and satisfaction among playgrounds at urban-, community- and neighborhood-scales?

To answer these questions, the city of Manhattan, Kansas, was selected as the study area. Three playgrounds there were chosen as study sites to provide comprehensive data regarding playground utilization.

In the first phase, the report employs a field audit to collect playground information about number and type of play equipment, upkeep, and number of users. In the second phase, a playground parent survey was conducted to collect children's playground utilization data from their parents during visits to the study sites. Survey questions included playground utilization frequency, overall satisfaction, satisfaction from play equipment, utilization preferences, and basic playground users' demographic information. During the survey, parents were also asked to identify playground problems and merits to help this study better represent playground utilization status.

5 PURPOSE OF THE STUDY

The purposes of the study are (a) to examine the association between playground utilization and playground satisfaction, (b) to examine the association between individual play equipment utilization and satisfaction, and (c) to examine differences in playground utilization and satisfaction among urban-, community- and neighborhood-scale playgrounds.

CHAPTER 2 LITERATURE REVIEW

1 OVERVIEW

It is necessary to look into the concepts of children's play and outdoor play in order to get a thorough understanding of the research topic. Table 1 summarizes theories on play (Fitzgerald, 2005; Stagnitti, 2004).

Early Theories of Play		
Surplus Energy	Herbert Spencer (Spencer, 1895)	Play is a way to burn surplus energy when fed and no other things to do.
Recreation Theory	Moritz Lazarus (1883)	Play is a way to restore energy.
Instinct Practice Theory	Karl Groos (1896)	Play is the way animals learn and practice life skills.
Catharsis Theory	Ancient Greeks	Play is a safety valve for purging aggressive emotions.
20th Century Concept of Play		
Self-Expression Theory	Elmer Mitchell & Bernard Mason	Play is a form of self-expression to find outlets for energies and express personalities.
Play as a Social Necessity	Joseph Lee, the father of play movement in America	Play is a very important development force in child development and community life.
Typologies of Play Activity	Roger Caillois & Joseph Lee	Caillois classified play into different types. Play shapes personal character development, which involves lessons of discipline, sacrifice, and morality.
Contrasting Styles of Play	Roger Caillois	This compares different types of play behavior.
The Play Element in Culture	Johan Huizinga	Play pervades all of life. Play types are contests for something or representations of something.
Psychological Analysis of Play		
Play in Personality Development	Lawrence K. Frank	He points out that play is important to the psychological and emotional development of children.
Stimulus-Arousal Theory	Sigmund Freud	Play is to seek stimuli of various kinds, both to gain knowledge and to satisfy a need for excitement, risk, surprise, and pleasure.

Competence Effectance Theory	Mihaly Csikszentmihalyi (2000)	Play is motivated by the need of the player to test the environment, solve problems, and gain a sense of mastery and accomplishment.
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Table 1 Play theories (Fitzgerald, 2005; Stagnitti, 2004)

2 IMPORTANCE OF PLAYGROUND AND PLAY

Bob Keeshan, the famous American television producer and actor, once said, “*Play is the work of children. It's very serious stuff.*” In fact, children’s play is taken seriously by various disciplines of science, especially cognitive and developmental psychology, and pedagogics. The science of urban planning, in its very early stage, also reached the conclusion that children’s play must be taken into account in modern urban settings (Frost & Wortham, 1988b). The playground was considered an indispensable component of almost all parks.

Chesterton (Chesterton, 1908)(Chesterton, 1908)(Chesterton, 1908)(Chesterton, 1908)(Chesterton, 1908)(Chesterton, 1908)said, “*The true object of all human life is play. Earth is a task garden; heaven is a playground.*” (1908, p. 96). Desire to play is one of the most important components of human nature; thus, it plays a very important role in every aspect of our development from childhood to adulthood. Ovid wrote in his book *The Art of Love*, “*In our play we reveal what kind of people we are,*” emphasizing the importance of play in our psychological development towards adulthood (AD 2/1957).

Shortly after the introduction of the first prototype playground— a sand garden in Boston, Massachusetts in 1885 — large cities like Boston, New York, and San Francisco quickly recognized the importance of playgrounds and began to incorporate them into their parks where children’s free outdoor play could safely happen (Frost & Wortham, 1988a). Recognizing the need for more playgrounds, former President Theodore Roosevelt expressed his support for building more of them to give children safe places to play in 1907 (Roosevelt, 1907). This

presidential speech helped playgrounds gain national recognition and they soon began to appear around the country (Albert, et al., 2011).

3 CHILDREN'S PLAY

Children's play appears to be a deceptively simple concept, but defining it is actually very complex. It is almost impossible to find a simple and universal definition for children's play. Modern science provided some insights to the concept of play. Bundy noted, "*There is little agreement and much ambiguity about virtually every aspect of play, from its definition, to its purpose, to the ways in which it manifests itself*" (2001, p. 89). The process of play can be interpreted from many scientific perspectives. According to Gary,

Play in our species serves many valuable purposes. It is a means by which children develop their physical, intellectual, emotional, social, and moral capacities. It is a means of creating and preserving friendships. It also provides a state of mind that, in adults as well as children, is uniquely suited for high-level reasoning, insightful problem solving, and all sorts of creative endeavors (2008).

Children's play is a cognitive process and a voluntary activity, which contributes to cognitive development, problem solving, creative thought, innovation, flexibility, enhanced problem solving, and adaptation (Piaget, 1962; Vygotskij, 2012; 1967). Arousal modulation theories emphasize the importance of the interestingness of play environments. It was believed that play is associated with exploration of objects, which reduces the level of arousal when novel situations are encountered; and when the subject of play is bored, arousal is increased by exploration. In other words, researchers believe play is an autonomous stimulus-seeking process

(Berlyne, 1960; Ellis, 1973; Hutt, 1966). These well-established theories support building diverse and interesting public playgrounds or play environments, for children and even adults.

There are also classical theories about children's play. English philosopher, biologist, anthropologist, and sociologist, Herbert Spencer (1895) said that play occurs because children have excess energy. This simple remark emphasized the necessity of children's play, which means play cannot and should not be suppressed or made impossible by outside forces or the lack of quality play spaces. German philosopher and psychologist Moritz Lazarus (1883) also pointed out that play occurs because children need to restore their energy or simply relax through nonproductive activity.

All these theories recognize the importance, necessity, and complexity of children's play. Children's complex developmental needs can only be satisfied in a play environment that contains diverse play equipment carefully integrated into a well-designed landform with ample natural play opportunities. The notion that a patch of cushioned flat ground with fixed play equipment can satisfy children's play is an over-simplified model. Play equipment can only provide raw physical exercise, which was the purpose when it was first introduced in early playgrounds. Based on these theories, it is not hard to conclude that current playgrounds with manufactured play equipment provided by municipalities are often less interesting and lack of play opportunities.

4 OUTDOOR PLAY

Outdoor play usually means the play occurs in an outdoor environment. It is a broader concept that includes the play that occurs at playgrounds. Therefore, outdoor play theories also apply to playground play situations.

Henniger pointed out that “*outdoor play, especially playground play, can be as effective as indoor play in facilitating young children’s development*” (1993). Frost and Wortham also suggested that “*the outdoor play environment should enhance every aspect of child development — motor, cognitive, social, emotional — and their correlates — creativity, problem solving, and just plain fun*” (1988, p. 24-25). In urban settings, Davies believes that outdoor free play is a crucial component for every aspect of child’s development; the outdoor play gives children a great sense of freedom that indoor play can never give. He argues that children need to feel, touch, hear, and smell the nature so that they can make connections between themselves and natural environments during their outdoor play. Davis believes that the importance of early childhood outdoor play has been undervalued greatly. Because of the importance of the child’s outdoor play, more emphasis should be put on the design of play space or playgrounds (1996). Apparently, the outdoor play that Davies mentions is not just a plain patch of lawn or traditional playgrounds with fixed equipment.

Randy White and Vicki Stoecklin pointed out that “*if children could design their outdoor play spaces, they would be rich, developmentally appropriate learning environments where children would want to stay all day*”. They believe that children’s playgrounds should “*not only be fully naturalized with plants, trees, flowers, water, dirt, sand, mud, animals, and insects, but also would be rich with a wide variety of play opportunities of every imaginable type*” (1998, p. 1). According to arousal modulation theories, the play environment should be deliberately designed and include elements that could satisfy children’s desire for exploration (Stagnitti, 2004).

An intricately designed outdoor play environment encourages a child’s imaginative, creative, and dramatic play with his or her peers (Frost et al., 2008). During these complex

activities with plenty of interactions between peers, children could experience disagreements and conflict-solving processes, and build up social skills (Laursen, Hartup, & Koplas, 1996). Talbot and Frost argued that current technology-inspired, man-made fixed structures in playgrounds have replaced the vibrant, magical, beautiful natural environment. They also pointed out that diverse and vibrant outdoor natural environment provides the ideal setting for children's play, and inspires children to discover and learn before their limits solidify and their minds are bound (1989). These theories support the idea that every playground should be equipment diverse, vibrant in natural elements, and have its uniqueness in landscaping and play equipment design.

5 PLAYGROUND HISTORY

a. The First American Playground



Figure 1 Playground at Golden Gate Park in San Francisco (University of Michigan Library, 2015)

Some believe the first modern playground was the idea of Germans, who built indoor gymnastics for children to play in, but the German playground idea had a very short life in America. The first urban outdoor play space in the U.S. appeared in the city of Boston, Massachusetts in 1885. The Massachusetts Emergency and Hygiene Association (MEHA), all members of the Boston Women's Club, volunteered to teach poor children morality, manners, and hygiene during their stay in a play space called a sand garden built by the organization (Taylor, 2009). The sand garden provided a pile of sand in a working-class district for children to play in while their immigrant parents worked long hours in factories. Soon after its introduction, sand gardens gained popularity in major big cities in the U.S. The responsibility of building more of them was transferred to the Boston city government after the municipal authority recognized the value of these outdoor play spaces. Later, "playground" was used as the name of these play spaces and play equipment was introduced into these playgrounds (Taylor, 2009). Generally, people think these sand gardens were ancestors of American playgrounds. By 1889, there were 21 playgrounds in the city of Boston and many other cities started to build similar playgrounds. In Philadelphia, there were more than 20 similar playgrounds and sand gardens all over the city.

The rapid appurtenance became the playground movement in the U.S.; however, none of these playgrounds had any other equipment until Lillian Wald and Mary Brewster built a playground in New York with a large sand pile, swings, gymnastic equipment, and a baby hammocks enclosed by border of flowers, a wisteria-covered trellis, and two ailanthus trees in 1895 (Spain, 2001). This was considered to be the first "complete" playground in the U.S. (Spain, 2001). Some believe the first American playground was established at Golden Gate Park in the city of San Francisco In 1887. This playground provided swings, slides, a goat-pulled cart, and is

the most popular piece — a Roman temple carousel, which was offered the opportunity to run at 1939 World's Fair in New York (Young, 1995).

b. Playgrounds Gain National Recognition

The playground movement was a parallel event with the City Beautiful movement in major cities in the U.S. The playground movement was considered as a competing opponent for resources to the City Beautiful Movement at first, but playgrounds were soon considered a necessary part of public parks in major U.S. cities (Cranz, 1982). The American Playground Association was founded in 1906. Its mission was to promote organized playground play. Structured play was considered a social improvement, keeping children out of the streets. Play structures naturally become the best solution to provide physical and moral education. In 1907, playgrounds with fixed play structures gained national recognition thanks to a speech given by former President Theodore Roosevelt, where he noted:

City streets are unsatisfactory playgrounds for children because of the danger, because most good games are against the law, because they are too hot in summer, and because in crowded sections of the city they are apt to be schools of crime. Neither do small back yards nor ornamental grass plots meet the needs of any but the very small children ... since play is a fundamental need, playgrounds should be provided for every child as much as schools (Roosevelt, 1907).

Since then, playgrounds have been considered essential to urban environments. Play equipment such as swings, monkey bars, merry-go-rounds, see-saws, etc. became standard and conventional options for all playgrounds around the country. Located within parks, playgrounds benefit greatly from large open spaces and a natural environment, which vastly improved the overall environmental conditions and usability of playgrounds when compared to early 20th

century playgrounds (Veitch et al., 2006). This combination of public parks and playgrounds solved the aesthetic concerns regarding early playgrounds (Frost & Wortham, 1988b).

The first complete playgrounds in New York and San Francisco set the basic tone for traditional playground design we see today, which includes swings, slides, merry-go-rounds, and play structures, etc. Many such play equipment were dangerous by today's standards, according to the Consumer Product Safety Commission, but redesigned versions of these play equipment are still being used today. As the number of playgrounds grew all over the country, more and more manufacturers started to jump into the new industry.

c. Adventure Playgrounds

With traditional playgrounds thriving around the U.S., adventure playgrounds started to appear in Europe in the 1930s. The first adventure playground in the U.S. was built in Huntington Beach, in the 1970s. Educators noticed that children preferred to play in natural environments with natural or man-made materials, rather than to play in playgrounds with fixed play equipment. Unlike traditional playgrounds with manufactured play equipment, these adventure playgrounds provided materials such as empty boxes, wooden boards, and tubes as play material, which children could use to build and create with as they pleased. However, the nature and appearance of these adventure playgrounds raised great controversies and soon faded away from playground history (Frost & Wortham, 1988b; Matthews, 1985). The only open adventure playground in the U.S. today is the Berkley Adventure Playground, which was established in 1979. Today, playgrounds around the world are dominated by manufactured play equipment with fixed play equipment, which has a cleaner look with pleasing colors for urban planners and most adults (Matthews, 1985).



Figure 2 Children playing at the Berkley Adventure Playground (Howard, 2014)

d. Standardization of Playgrounds

By the 1960s, playground equipment manufacturing had become a big business due to decades of strong demand for playground equipment around the country. Manufacturers started to make cookie-cutter playground equipment, selling it as modular components around the country.

Meanwhile, McDonald's restaurants started to build and use its own in-store playgrounds with these cookie-cutter components for its national chains. All its equipment has a yellow, blue, and red color design matching the company's color theme. Susan Solomon blamed MacDonal'd's for its reinforcement of the cookie-cutter playground equipment design, arguing that Macdonal'd's helped shape the monolithic boring playgrounds around the country or even the world, as play equipment manufacturers around the world naturally adopted this dumbed-down, safety-driven playground design during their mass production of it (2005).



Figure 3 A play structure in China (beidatoys, 2015)

In 1981, the U.S. Consumer Product Safety Commission, or CPSC, published its first Handbook for Public Playground Safety. In 1991, the American Society for Testing and Materials, or ASTM, published its Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment, ASTM F1292. These two documents established the manufacturing and inspection standards for modern playgrounds. The color theme and design of play equipment used in the CPSC document reflected the influential McDonald's design. According to the National Program for Playground Safety, or NPPS, most states have adopted safety-related playgrounds laws and 13 states have adopted all or parts of CPSC and ASTM guidelines to regulate playground provision. With the help of these organizations and their guidelines, along with international economic ties, playground equipment

manufacturers around the world were united. A playground in China would look nearly identical to any playground in the U.S.

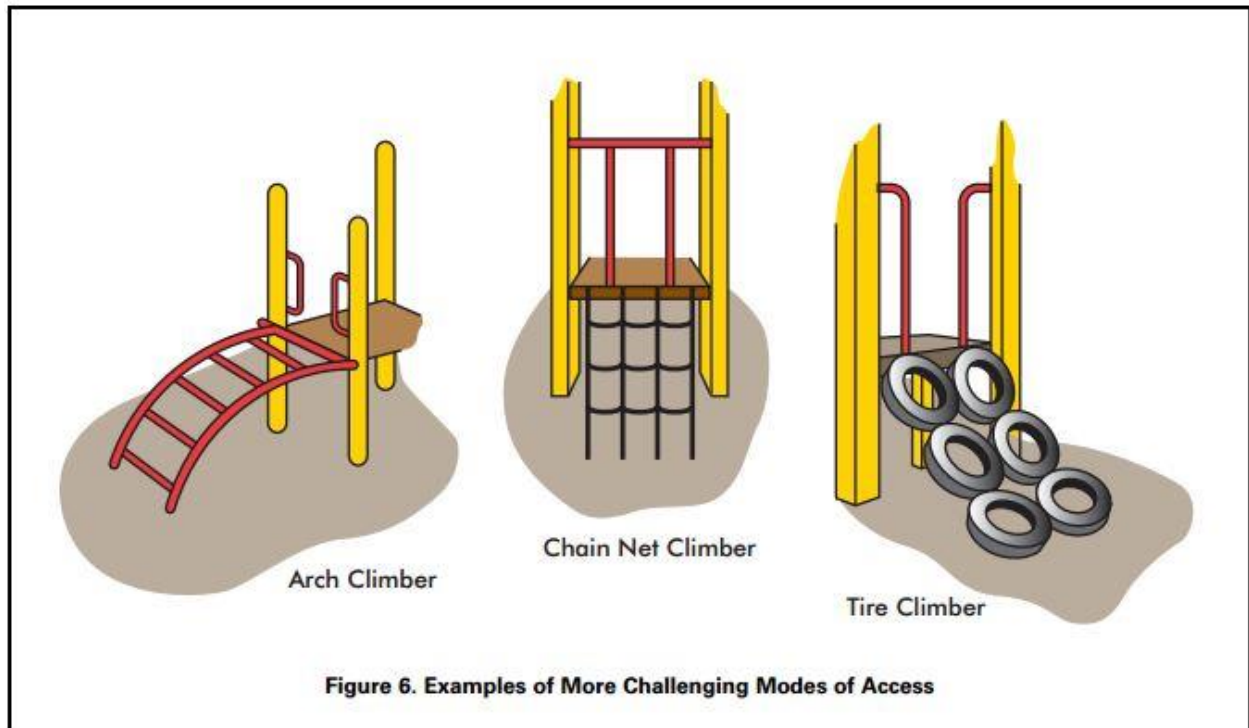


Figure 4 Standard play structures in the CPSC handbook (CPSC, 2014)

Joe Frost (2012) and Kaitlin O'Shea's (2013) divided the evolution of the playground into several eras:

Eras	Playground Classification	Characteristics
1880s-1890s	Sand gardens	Sandboxes in lots beside buildings
1900s-1920s	Model playgrounds	Tall apparatuses built with steel tubes, merry-go-rounds and other twirling contraptions
1930s-1940s	Model playgrounds	Development slowed or suspended due to the depression and war

1940s-1950s	Adventure or junk playgrounds	Going on an adventure and exploring through caves, over landscapes, and building elements using found objects, without much supervision. Some of these playgrounds were accessible.
1950s-1970s	Novelty playgrounds	Rocket ships, slides, animal shapes, imaginative tunnels and shapes, made of metal
1970s-1980s	Standardized playgrounds	Rounded edges and hard plastic equipment -- a response to rising concerns about playground safety
1980s-present	Modern playgrounds	A surge in imaginative playgrounds with safe surfaces, and varying themes and materials

Table 2 Playground evolution eras

The classification reflects a simplified period for each era; however, there were overlaps between periods throughout the playground evolutionary history.

Among all these eras, the adventure playground era stood out for its innovative ideas on playground design and application of play theories. Adventure playgrounds offer loose parts, materials, tools, existing landscape, and built or natural environments. These equipment encourage use of the imagination and creativity under the supervision of play instructors. Frost and Wortham (1988) wrote that Carl Theodor Sorensen, a Danish landscape architect, proposed the first such playground in 1936 and it was tested in 1945 in Emdrup Denmark. America's first adventure playground was built in 1974 and the number of these adventure playgrounds reached its peak at 16 in 1977. Due to the concerns about the junky appearance, risk of getting hurt, and liability, adventure playgrounds started to disappear after 1977, despite their popularity among children and parents, and by 2012, only four such playgrounds were left in the U.S. (Frost et al., 2008). Adventure playgrounds did not become the new standard in the modern playground era, but they exposed people's love for some of its elements — loose parts, diverse landscape integration, and natural elements, all of which are highly thought of by play theory researchers (Carolina, Learning, & Alliance, 1999; Clements, 2004; Henniger, 1993; Matthews, 1985).

Joe Frost's classification indicates the modern playground era should bring the explosive appearance of imaginative playgrounds with safe surfacing and diverse themes (Frost & Wortham, 1988b). However, the surge in imaginative playgrounds with varying themes and materials did not happen as expected. From the 1980s to the present, the most noticeable improvements over previous eras have been safety improvements. The design idea remains almost unchanged when compared with other eras, which emphasizes motor activities. Beckwith argued that the modern playground era is only a safety-upgraded standard playground era, which does not meet the expectations described in child development and play theory research (2000). Many believe that the fun has been taken out of playgrounds gradually by the ever-growing safe design guidelines (Cunningham & Jones, 1999; Hart, 2002a; Masters, 2011; Solomon, 2005).

6 LIMITATIONS OF STANDARD PLAYGROUNDS

The modern playground era is being shaped by our imagination with high expectations from researchers, who have accumulated significant knowledge since the playground movement began in 19th century. We have accumulated enough knowledge to build better environments. Frost said:

Good play environments have magical qualities that transcend the here and now, the humdrum, and the typical. They have flow qualities that take the child to other places and other times. They are permeated with awe and wonder, both in rarity and in imaginative qualities. Bad play environments are stark and immutable, controlled by adults, lacking resiliency and enchantment. Few dreams can be spun there, and few instincts can be played out. The wonders of nature, the

delights of creating are all but lost for children restricted to such places. (Frost et al., 2001).

Our children are actually overprotected on manufactured cookie cutter playgrounds. Our play environment is actually over controlled by modular equipment design concept. Within these strict guidelines and rigid design concepts, we cannot design creative play environments for children. Frost and Wortham (1988) pointed out the problem and suggested that “no matter how ingenious or radical many of these playground equipment become, they are just an important ingredient of playground design and researches should direct energy to development of total play environment.” Frost and Wortham (1988) believe the total play environment includes “natural features –living things, plants, animals, dirt, hills, streams, portable materials — blocks, tools, utensils, building materials and support structures — natural shade, shelter, paths, cooking facilities, wheeled vehicle paths...”

Hart also questioned the monotonous, standard cookie-cutter playgrounds in his study by pointing out, “Children have an urge to explore, touch, manipulate, and experiment with their world in order to understand it. This has had important influence on the design of many pre-schools and kindergartens but not much on public playgrounds.” He continued, “*The value of play for creativity is also little recognized by those who plan and design public settings*” (2002, p. 136).

7 PREVIOUS STUDIES OF PLAYGROUND UTILIZATION

Gold (1972) noticed that despite good weather conditions, convenient access, and good development, maintenance, or program, neighborhood parks and playgrounds are significantly underutilized. Facilities he studied failed to attract people to the site. Gold pointed out several

problems in the park and playground planning process. First, the playground planning process considers the quantitative instead of qualitative aspects of the recreation experience. Second, playground planning does not reflect citizen participation. Third, the playground planning process reflects a quantitative statement of an idealized system as envisioned by supplier, not the user. However, this study did not examine the character of a specific facility, rather it focused on the policy intervention and literature review. Gold finally concluded that more researches are needed on neighborhood-level parks and playgrounds.

Howard and Crompton (1984) found in their study that a large portion of participants never used a city's recreational facilities on a municipal recreational facility utilization. Under the overall facility underutilization status, parks and playgrounds were actually the most used facilities. Only about 1% of people use parks and playgrounds daily, and around 2% to 4% use them monthly. The vast majority of participants never use them or use them less than once a month. The study also looked at income level and playground utilization. They found that 80% of people with low income were not likely to use parks and playgrounds because many of them did not have cars to access these facilities. The study also examined age group utilization patterns among adults. Lack of time is the biggest constraint that stops people from using recreational facilities, about 42%, and 26% of people prefer to stay at home. Seventeen percent of people thought the facilities were boring. These data showed that public recreational facilities were experiencing an overall underutilization. The research had a very large sample size and was conducted in three different states, but the results exhibited similar patterns of facility underutilization. The researchers believed the results were very generalizable for most municipalities.

A more recent park visitation research project examined whether park visit frequency was associated with time spent in various domains of physical activity among adults living in disadvantaged neighborhoods. Playground visit frequency was used to measure park and playground utilization. The results showed that playground visit frequency was associated with greater odds of engaging in high amounts of transportation activities (Veitch, Ball, Crawford, Abbott, & Salmon, 2013). The research adopted the international physical activity questionnaire (Craig et al., 2003), which uses park visitation frequency per week and per month as measurements for park utilization. The study did not draw any conclusion on playground utilization level.

Another study conducted in New Zealand utilized GPS and accelerometers to record children's activity in the city of Dunedin for seven days. The study showed that overall, only 1.9% of children's physical activities happened in parks with playgrounds. The study indirectly reflected the low utilization of public playgrounds and concluded that simply providing neighborhood equipment such as playgrounds or even public parks as environments to promote physical activity needs further consideration (Quigg, et al., 2012). This study mentioned that playgrounds and parks could be used as neighborhood equipment or called neighborhood playgrounds or neighborhood parks, which serve people living in the neighborhood area within waling distances. The study implies that providing current dominant manufactured playgrounds would not improve children's physical activity, which is an interesting result motivating more research on playground utilization and factors affecting playground utilization.

Another type of research was done in Haifa, Israel, in 2011, mainly addressing transportation, environmental variables, and cultural difference between Israelis and Arabs in their playground use. The study not only looked at transportation and environmental factors, but

also examined playground utilization frequencies and playground satisfaction ratings from playground users. The study used an ordered probit estimation, and binary logic estimation to analyze utilization frequency and satisfaction alone with environmental factors, but no play equipment was involved. The study concluded there are significant differences between Jewish populations and Arab populations in their playground utilization patterns. Playground utilization frequency and playground satisfaction ratings presented significant differences in similar social economic status (Albert et al., 2011).

Another study investigated seasonal playground utilization, user preferences, and perceptions of safety and upkeep. It compared the number of visitors to measured playground utilization. The data was collected through playground observation at the entrances of selected playgrounds and a survey tool was used to collect playground users' perceptions about playgrounds. Cleanliness, maintenance, travel mode, and safety travelling to playground were surveyed. However, the research mainly addressed environmental and socio-economic factors that affect playground utilization. Play equipment at playgrounds and their association with playground utilization are not mentioned in the study (Silver et al., 2014).

The above studies provided a general research framework regarding playground utilization and other related variables. Survey, audit, and observation tools were used in these studies. The main difference of this study from the above utilization studies is that playground utilization is examined with play equipment at the playgrounds selected.

CHAPTER 3 STUDY DESIGN AND METHODOLOGY

1 SITE SELECTION AND SURVEY POPULATION

Three playgrounds were selected based on the size and function of parks they belong to. The city of Manhattan does not have its own park classification system. But many other municipalities have similar classification systems. Generally, in the U.S., parks with playground can be categorized into the neighborhood-, community- and urban-scale parks under the state or city park system (Table 3):

Urban Park System	Acreage	Service Radius (mile)	Service Population
Neighborhood park	5-20	< 2	3,000 to 6,000
Community park	30-75	<3	18,000 to 26,000
Large recreation (urban) park	>75	3 to 4	80,000-100,000

Note: Examples from Fort Worth, Texas (City of Fort Worth, 2015) and the state of Washington (Enger, 2005)

Table 3 Park classification

Following the logic, this study classifies playgrounds in these parks as mini park playground, neighborhood park playground, community park playground, and large urban park playground.

Table 4 presents the basic information of selected playgrounds in the study area. Selected playgrounds naturally fall into categories derived from park classification. In order to examine playground underutilization in the city of Manhattan, typical playgrounds from all categories were selected, except the mini playground, which is not available in the study area. Considering the central location and history of the community, this study considers the City Park playground as the urban park playground that serves the entire city of Manhattan. Cico Park playground is considered as a community park playground; therefore, its playground mainly serves people

living in the west part of the city. Northview Park playground is a neighborhood park playground that serves people living in the Northview neighborhood.

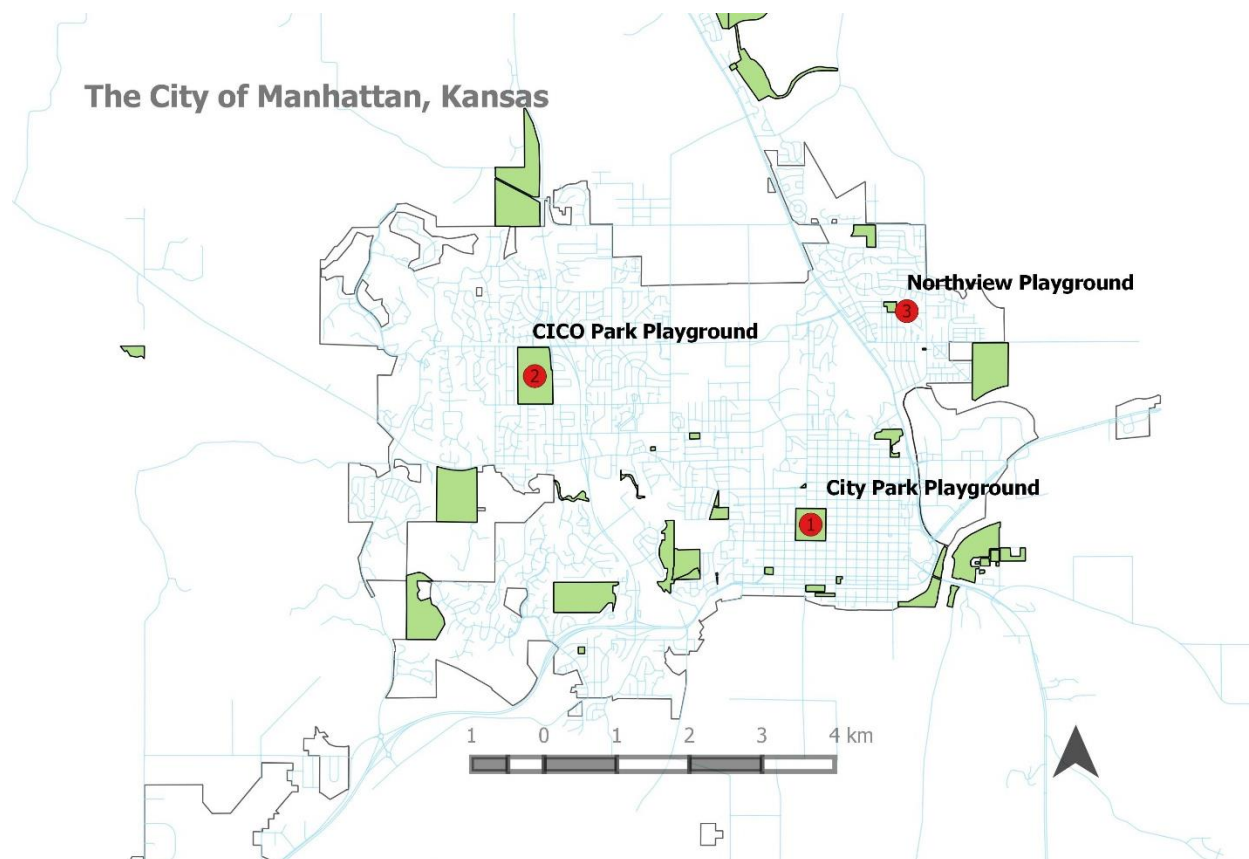


Figure 5 Selected playgrounds

ID	Type	Playground Name	Park Acreage	Playground Acreage	# of Entrance	# of Parking	# of Play equipment
1	Urban park playground	City Park playground	45.00	0.59	3	50	32
2	Community park playground	CICO Park playground	97.00	0.49	2	10	23
3	Neighborhood park playground	Northview playground	6.42	0.23	2	Street parking /other	24

Table 4 Demographic information of selected playgrounds

As shown in Map 1 and Table 4, this study chose three typical playgrounds in the city of Manhattan: 1) community playground; 2) large urban playground; and 3) neighborhood playground. The following table is the complete list of play equipment at these playgrounds.

		Urban Park Playground (City Park)	Community Park Playground (CICO Park)	Neighborhood Playground (Northview Park)
	Play Equipment List	# of Equipment	# of Equipment	# of Equipment
Structure for 5 to 12	Slides	4	1	6
	Climbing equipment	7	2	5
	Tornado spinner	2	n/a	2
	Pretend play	1	n/a	1
Structure for 0 - 5	Slides	2	2	n/a
	Separate slide	n/a	1	n/a
	Monkey bars	n/a	2	n/a
	Pretend play	1	n/a	n/a
Other equipment	Belt swings	4	2	6
	Safe swings	2	n/a	2
	Bucket swings	2	2	n/a
	Balance beam	1		n/a
	Spring rocker	2	2	n/a
	Sandbox	1	1	n/a
	Water pad	1	n/a	n/a
	Rope climber	1	n/a	n/a
	Rock climber	1	n/a	n/a
	Merry-go-round	n/a	1	n/a
	Climbing cage	n/a	1	1
	Sound play equipment	n/a	1	n/a
	Cave	n/a	1	n/a
	Vending wagon	n/a	1	n/a
	Indian tent	n/a	1	n/a
	Wagon	n/a	1	n/a
	Canon	n/a	1	n/a
	Separate spinner (Sky Runner)	n/a	n/a	1
	Total Pieces of Equipment	32	23	24
	Total Kinds of Equipment	15	17	8

Table 5 Play equipment list



Figure 6 Urban park playground equipment (City Park)

The City Park was founded in 1857 and was the first park in the city of Manhattan. It has been used as the central urban park that serves the whole city for almost 158 years. It is no longer the biggest park within the city limits of Manhattan, but its historical role and geographical location makes this park the focal point of the park system in the city of Manhattan. The city park playground is the biggest and best-equipped playground in the entire city. No other playgrounds could better represent the urban playgrounds in the city. The utilization level of this urban playground represents the best performance available for an urban playground.

The playground is located in the southeast corner of City Park. It is close to downtown and Aggieville, and directly across the street from City Hall. As a part of the City Park of Manhattan, city park playground is the most frequently maintained park and its playground is diversely equipped. The playground has the only water pad in town. The large statue of Johnny Kaw, the landmark of City Park, stands with the playground. City Park's central location, rich play equipment, and ample play space indicate the playground of the park is designed for high-

volume use for the whole city. This playground represents the highest playground standards of the city of Manhattan. It also represents a typical urban playground with manufactured equipment. The playground in the City Park is a complete playground containing a water pad, a separate climbing area, public bathroom, water fountain, and three parking lots.



Figure 7 Community park playground equipment (CICO Park)

Founded in 1973, CICO Park is a typical community park, which serves the residential area on the near west side of the city of Manhattan. Even though it covers 79 acres, the park was never a replacement of the City Park. The playground in this park is much less maintained and most play equipment is from the novelty playground era of the 1970s. CICO Park was founded under an agreement among the city of Manhattan, Riley County, and USD 383. Its diverse recreational facilities provide space for city and county events.

The playground mainly serves residential areas on the west side of Sethchild Road. The playground in this park is maintained by Riley County. Despite the large park area, the playground is much smaller than the selected urban playground. The playground in this park has

retro designs from the novelty playground era, but this old equipment is being replaced gradually by manufactured equipment. The playground has the only merry-go-round in town. Recently, a tall novelty slide structure was replaced with a dumbed-down McDonald's-style slide structure during the course of this study.



Figure 8 Neighborhood park playground equipment (Northview Park)

The Northview Park was selected as the neighborhood playground. The Northview Park is still under construction. The playground is on the southwest corner of the park. It has the only cushioned artificial lawn in town. The playground functions in a typical neighborhood environment, where the residential neighborhood is within a quarter-mile range of the playground. The equipment is identical to that found in the City Park playground. Colorful and safe design indicates it is another typical manufactured playground. The artificial grass surfacing

for the play area produces a pleasing and moderate temperature on surface during all seasons, which looks very appealing and safe. The playground's only resting area is some benches. No public restrooms nor parking spaces are provided for this playground, but playground users can use the adjacent swimming pool parking just 60 yards away.

2 RESEARCH METHODS

a. Playground Audit

A playground audit records the following information on a playground:

- Number of individual play equipment and play equipment attached to a play structure
- Child capacity of the playground (provided by the city of Manhattan)
- Condition of each play equipment
- A count of the number of people using the playground

The preliminary observation was done from late August through early November, between 11:00 a.m. and 6:00 p.m. for five weeks.

The final part of the playground audit was to count the number of people using the facility. The counting took place between 11:00 a.m. and 3:00 p.m. or between 4:00 p.m. and 6:00 p.m., which are the most popular times for playground visits.

The complete playground audit form can be seen in Appendix B. All available playground equipment at the selected playgrounds have been listed in the audit form in the preliminary observation. Items to be audited were selected because they were observable and quantifiable criteria to describe the association between playground equipment and utilization in several similar studies (Colabianchi, Kinsella, Coulton, & Moore, 2009; Colabianchi et al., 2011; Rung et al., 2011). Some of the audit items, like moving speed of playground users, were not selected, because they are used to describe physical activity, which is not the subject this study will investigate.

b. Playground Parents' Survey

The second step of the study was to survey parents at playground. The survey did not collect information directly from children due to their limited reading ability. All information was collected from parents or guardians on site. All surveys were conducted in the afternoons on weekends with very good weather conditions for playground play.

During the survey, questionnaires were given to every adult with children at each selected playground. Parents on playgrounds were very interested in survey. No person rejected the survey, even those parents with small children.

The parent survey form asked participants to provide the following information:

- Basic demographic information
- Playground overall satisfaction rating and utilization frequency
- Satisfaction rating and utilization frequencies for each play equipment
- Identify playground problems from a list of problems
- Identify playground merits from a list of merits
- Participants' expectations from playgrounds
- Transportation mode and other information

Survey Variables	Type	Description
Age of children	Categorical	1. 0-5; 2. 6-10; 3. 11-15; 4. Over 16.
Transportation	Categorical	1. Driving 2. Biking 3. Walking
Distance from home	Categorical	1. 0 - 1/4 mile 2. 1/4 – 1/2 mile 3. 1/2 - 1 mile 4. More than 1 mile 5. More than 5 miles
Frequency of playground visit	Categorical	1. Rarely 2. Occasionally 3. Monthly 4. Weekly 5. Daily

Playground overall satisfaction and play equipment satisfaction level	Five-point likert scale	<ol style="list-style-type: none"> 1. Very unsatisfied 2. Unsatisfied 3. Somewhat satisfied 4. Satisfied 5. Very satisfied
Play equipment utilization frequency	Five-point likert scale	<ol style="list-style-type: none"> 1. Never 2. Rare 3. Sometimes 4. Very often 5. Always

Table 6 Survey variable

Table 6 is a list of variables and their scale classification used by survey forms. The survey form was compiled according to several survey studies on playground utilization patterns, and studies on association between playground utilization and physical activities (Silver et al., 2014; Wang, Monteiro, & Popkin, 2002). The relevant questions were extracted and modified to fit the needs of this particular study. These questions are all closely related to the playground equipment, and utilization and satisfaction. The full playground survey form can be found in Appendix A.

The playground survey successfully collected 131 samples from three selected playgrounds. The survey was conducted at 4:00 p.m. on three weekend afternoons with very good weather conditions for the three selected playgrounds.

Data collection at the community playground ended with 50 finished survey forms. Data collection at the large urban playground and neighborhood playground collected 30 finished forms. The same survey was conducted again for those two playgrounds and added 21 results for the large urban playground and 20 results for neighborhood playground, without duplicating participants.

The surveyor did not select participants based on any conditions or perceptions. In order to finish the survey as soon as possible, survey forms were handed out with a little gift to all qualified adults with a child on the playground until all forms were finished. Fortunately, all

people who got the form participated in the survey. Therefore, the sampled population is a snapshot of playground users at that particular time of the day when the survey was conducted.

CHAPTER 4 DATA ANALYSIS AND RESULTS

1 HOME-TO-PARK TRAVEL MODE

Indicating a willingness to help improve the city's playgrounds, 90 out of 131 survey participants provided their approximate living addresses, which enabled this study to look at the origins of playground visits. The original question was "Please tell us the street intersection closest to your residency if you are willing to share this information," thus identical intersections were recorded.

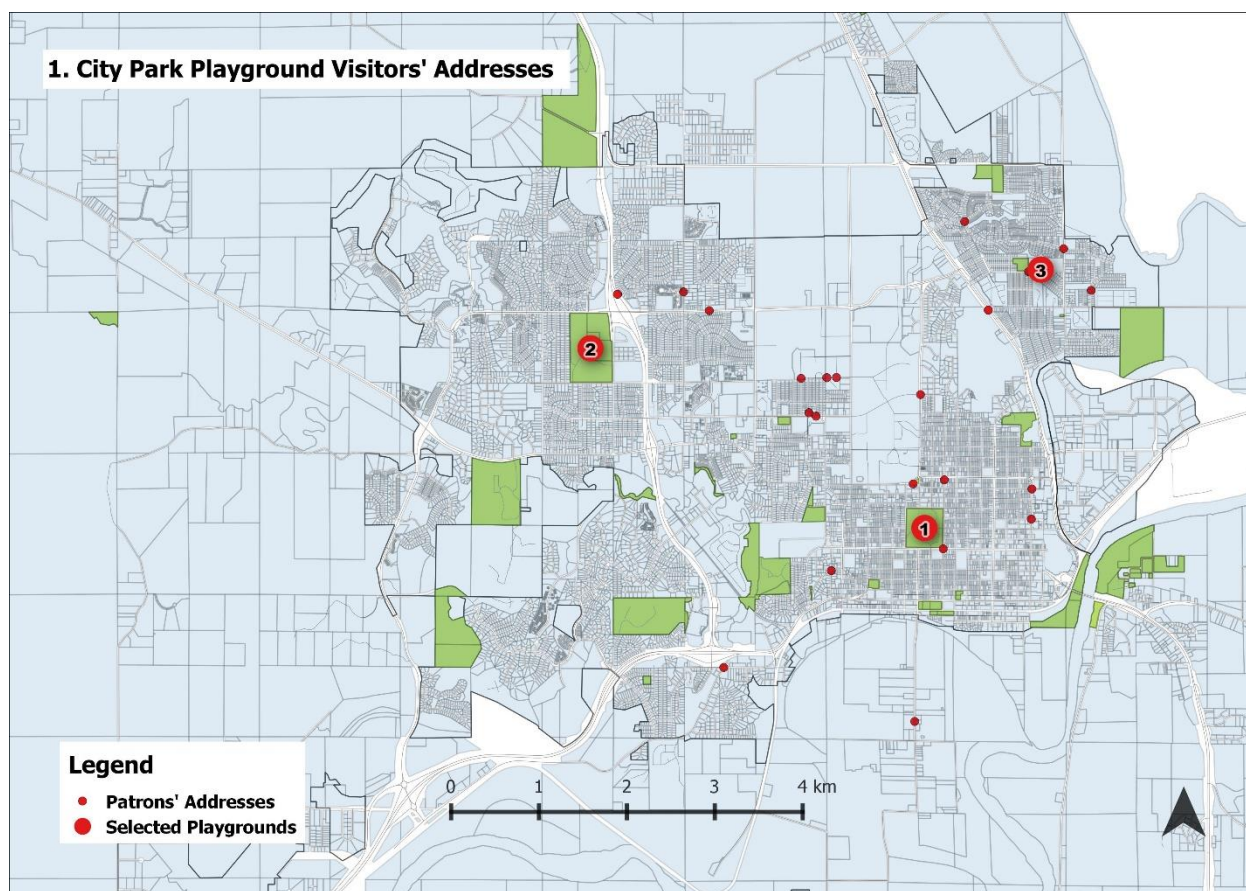


Figure 9 Playground visitors' home addresses

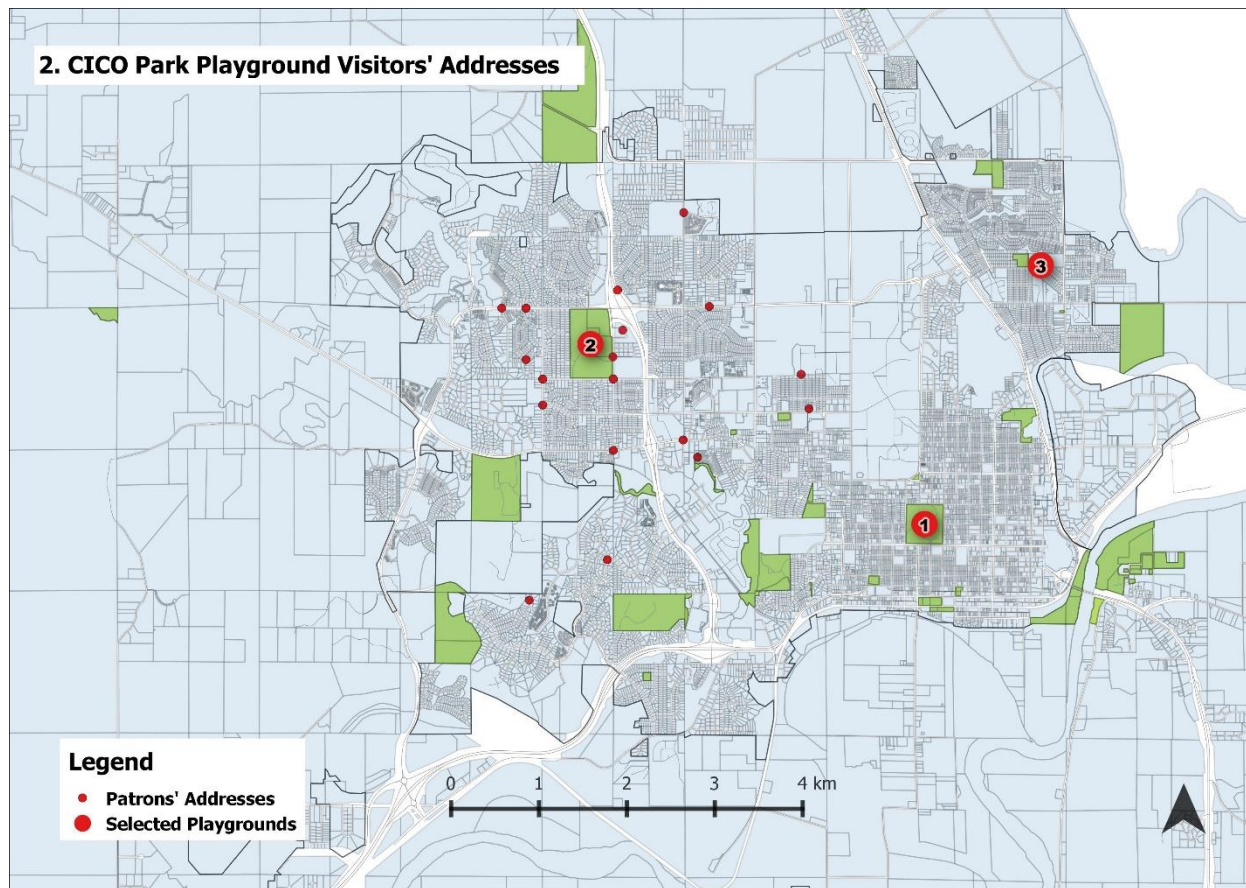


Figure 10 Playground visitors' home addresses

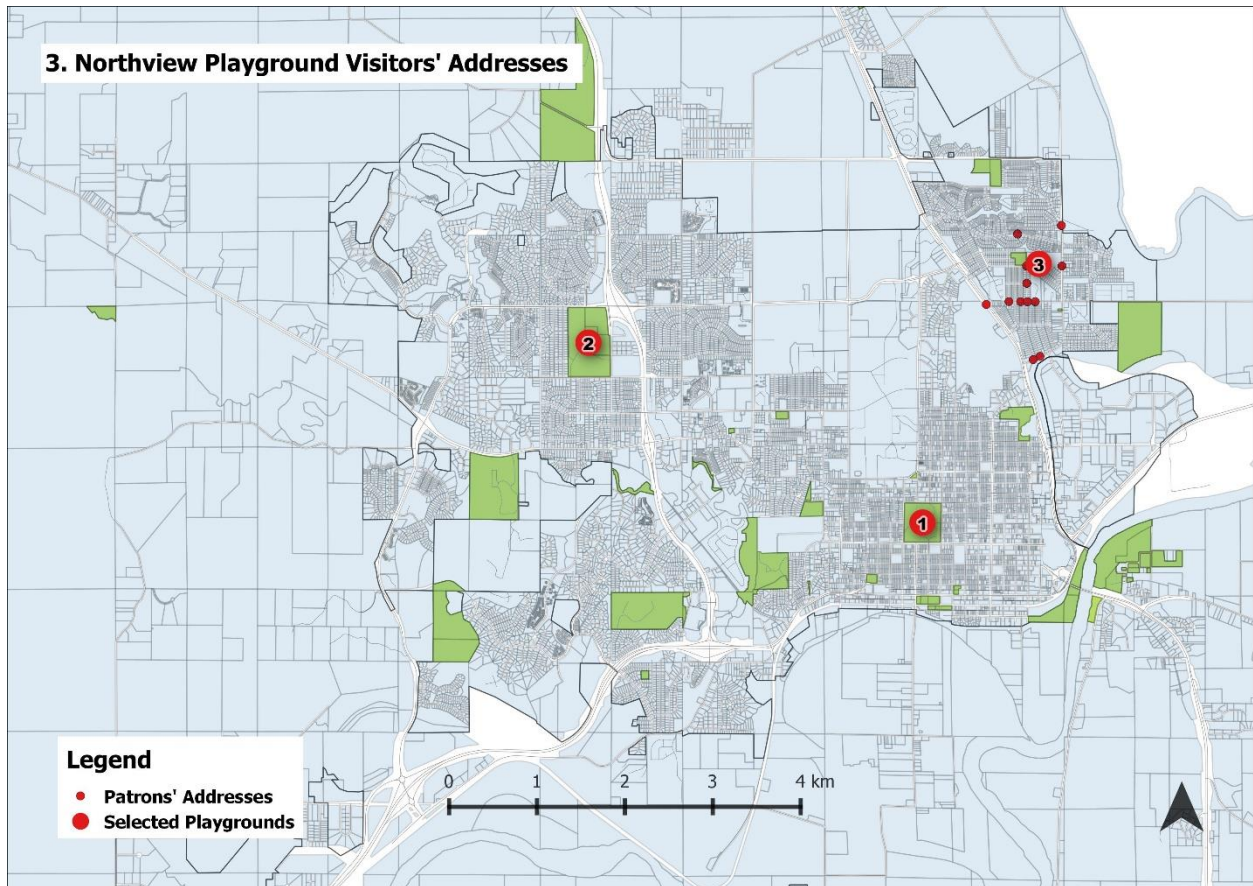


Figure 11 Playground visitors' home addresses

Figure 9, 10, 11 show points of geocoded addresses for all surveyed playgrounds visitors. Since the survey participants provided the nearest street cross as the approximate home address, there are overlapped address point in these maps. The origin of visitors confirmed that City Park playground (1) is a typical urban park playground usually accessed by people from all parts of the town, while CICO Park playground (2) is a community park playground that serves people from the surrounding areas, and Northview playground (3) mainly serves people living in the neighborhood within walking distances, confirming the playground is a neighborhood playground.

The travel mode of playground users also revealed some playground utilization patterns.

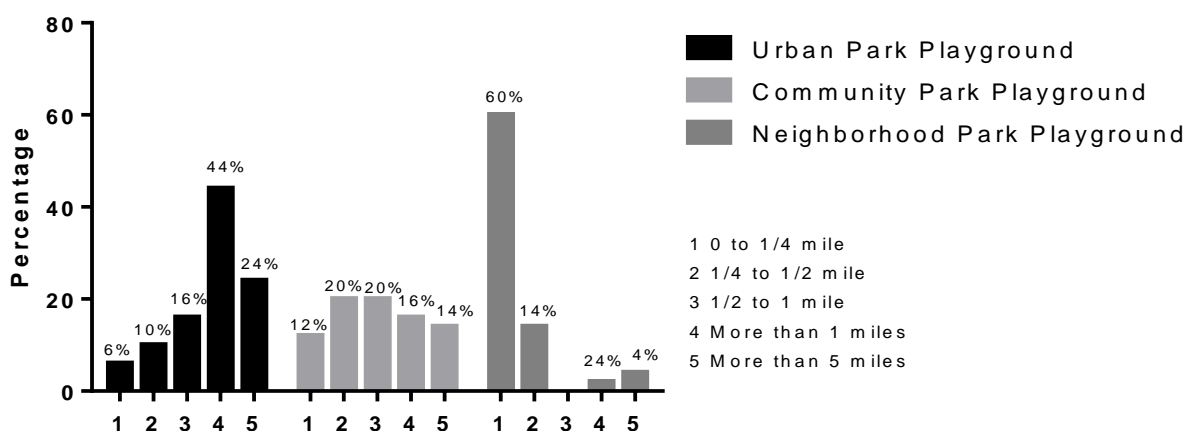


Figure 12 Travel mode of playground users

Figure 12 shows that as a community playground, City Park playground performs like a community playground as expected — 68% of its visitors traveled more than one mile to use the playground. Thirty percent of CICO Park playground users traveled more than one mile to get to it, and 52% traveled less than one-half mile to visit the playground. 74% Northview playground users traveled less than one-half mile to visit the playground. The network analyses shown in maps 3, 4 and 5 demonstrate the playground visitors' origins and shortest distances they might have traveled for their playground visitations.

2 TRAVEL TIME AND DISTANCE

The following table is the recorded travel time and distance for each playground's visitors. The data is visualized in Figure 12, 13 and 14. Some points are overlapped on the maps. Twenty-six visitors provided their approximate addresses at selected community playgrounds and the average travel distance was 2.6 miles. The maximum travel distance was 6.9 miles. The average travel distance indicates that the playground in the City Park is used as an urban park playground that serves the population in a radius of two to three miles. Twenty visitors provided their approximate addresses at selected community park playgrounds and the average travel distance

was 1.3 miles. The maximum travel distance was 4.1 miles. The average travel distance indicates the playground in CICO Park is used as a community park playground. Fourteen visitors provided their approximate addresses at selected neighborhood playgrounds and the average travel distance was 0.44 miles. The maximum travel distance was 0.8 of a mile. The average travel distance matches the neighborhood playground classification.

	Urban Park Playground		Community Park Playground		Neighborhood Park Playground	
	Time	Distance	Time	Distance	Time	Distance
Max	7.14	6.87	6.53	4.06	1.26	0.78
Min	0.75	0.47	0.35	0.22	0.14	0.09
Average	4.15	2.58	2.02	1.25	0.71	0.44

Table 7 Travel time and distance

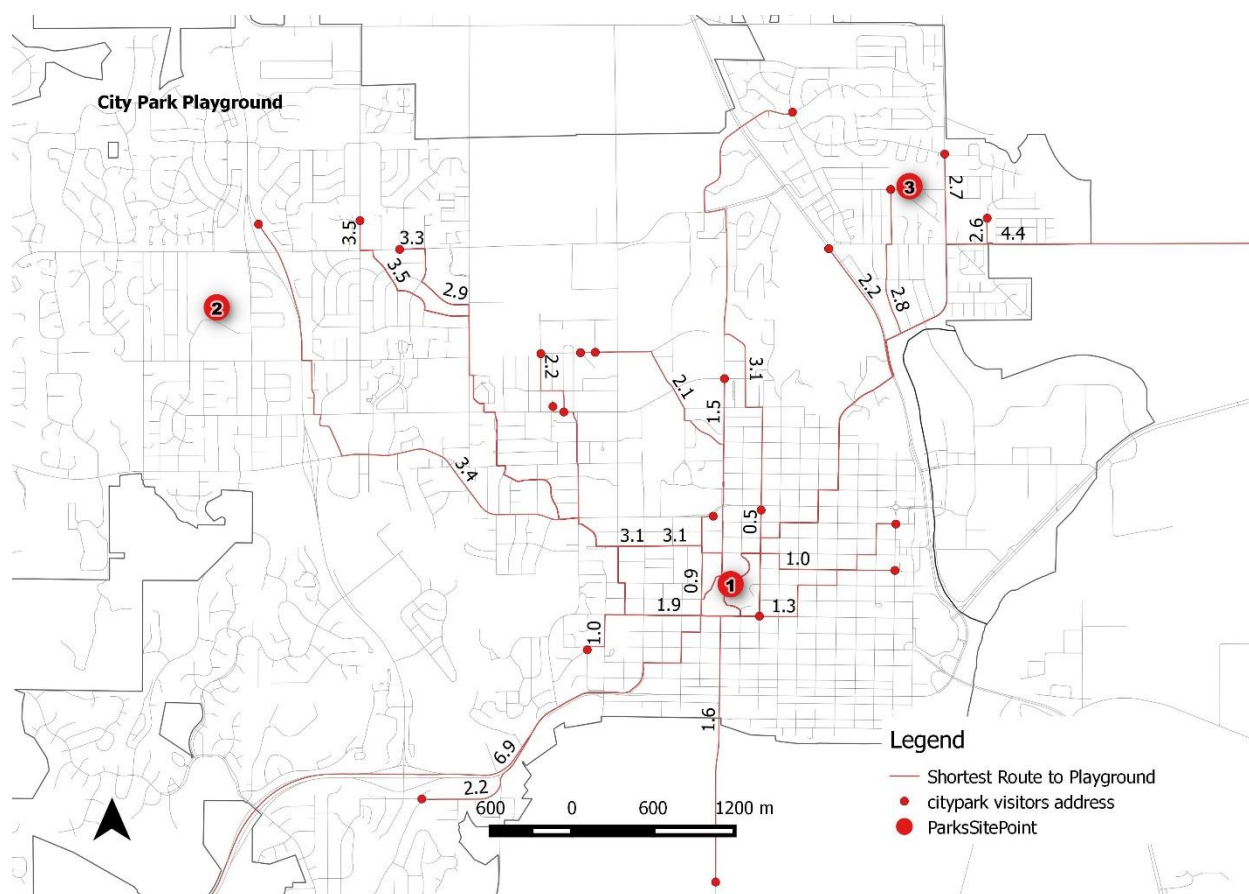


Figure 13 Home-to-park routes of urban park playground (City Park)

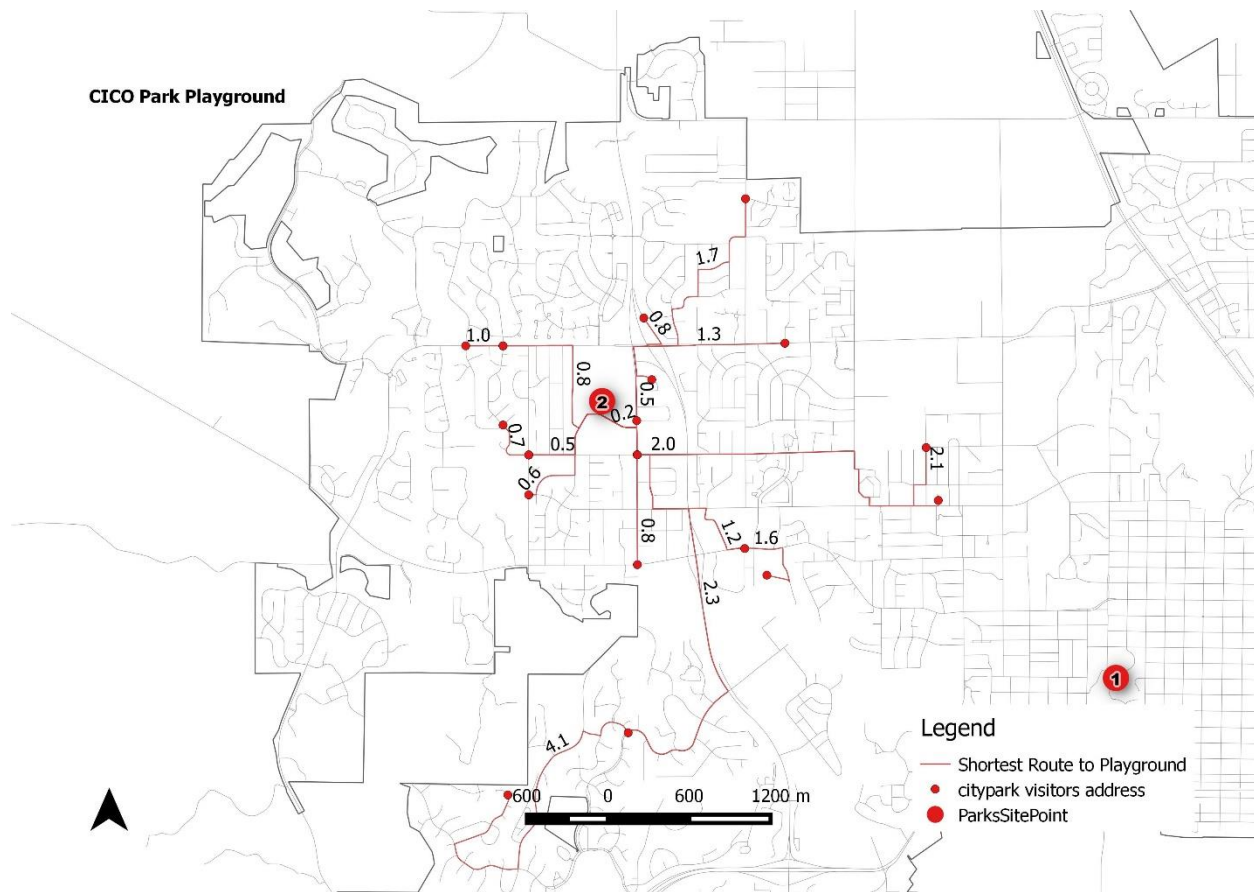


Figure 14 Home-to-park routes of community park playground (CICO Park)



Figure 15 Home-to-park routes of neighborhood park playground (Northview Park)

The above-average travel distance analysis (Figure 13, 14, 15) demonstrated that the playground characters such as location, size, number of play equipment, upkeep, and satisfaction ratings decide the playground service radius.

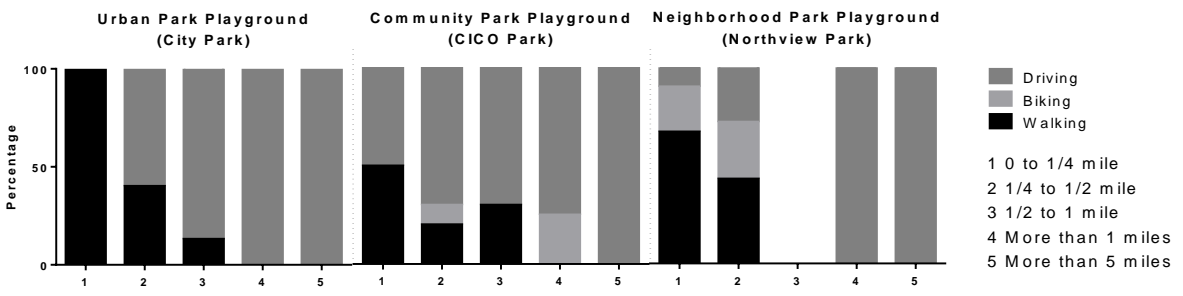


Figure 16 Travel preferences of playground visitors

Distance	Urban Park Playground (City Park)				Community Park Playground (CICO Park)				Neighborhood Park Playground (Northview Park)			
	Total	Walking	Biking	Driving	Total	Walking	Biking	Driving	Total	Walking	Biking	Driving
0 to 1/4 mile	6%	100%	0%	0%	15%	50%	0%	50%	75%	67%	23%	10%
1/4 to 1/2 mile	10%	40%	0%	60%	24%	20%	10%	70%	18%	43%	29%	29%
1/2 to 1 mile	16%	13%	0%	88%	24%	30%	0%	70%	0%	0%	0%	0%
More than 1 miles	44%	0%	0%	100%	20%	0%	25%	75%	3%	0%	0%	100%
More than 5 miles	24%	0%	0%	100%	17%	0%	0%	100%	5%	0%	0%	100%
Total	100%	12%	0%	88%	100%	20%	7%	73%	100%	58%	23%	20%

Table 8 Travel preferences of playground visitors

Figure 16 and Table 8 show that driving is the primary means of transportation for the urban park playground and community park playground. Table 8 shows, for the selected urban park playground, only 12% of the people walked to the playground and as distances increase, the walking percentages decrease rapidly; 100% of the people living in the 0 to one-half mile range walked, but no one biked to the urban park playground. Of the community park playground visitors, 73.17% drove to the playground, 19.51% of them walked, and 7.32% of them biked. Only 17.50% of neighborhood park playground visitors drove and 58% of them walked; 22.50% of them biked to the playground and two people living within 0 to one-quarter miles also chose to drive.

These data show that urban and community park playgrounds need more parking space to encourage people to visit. The playground audit shows there are only six parking spaces at CICO Park playground. Many people complained about the parking issues. The travel patterns of all playgrounds are actually formed by each location's visitor composition. Most urban and community park playground visitors are from 0-5 age group, who rely heavily on parents for getting around. Most of children in 0-10 age group are not reliable bike riders on city main roads. It is much safer for children in the 6-10 age group to ride their bikes in neighborhood areas. One thing needs to be mentioned — people still need to drive on most occasions when they need to

move more than one child from home to places even within walking distance, because playgrounds might be one of the destinations for a trip.

3 PLAYGROUND UTILIZATION BY PARENT GENDER

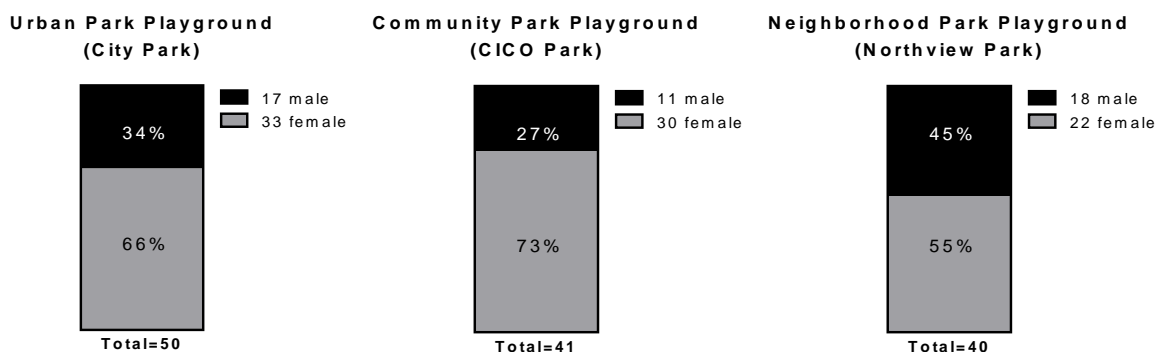


Figure 17 Parent gender distribution

Figure 17 show that, among survey participants, female parents are the major playground users at the urban park playground (66%) and community park playground (73%). Recorded samples at neighborhood park playground were 45% male parents, indicating male parents are more willing to take their children to a neighborhood playground, which was within walking distance, but female parents were still the majority in neighborhood park playground. Any playground improvement that finds favor with female parents might maintain or even increase the utilization of that playground.

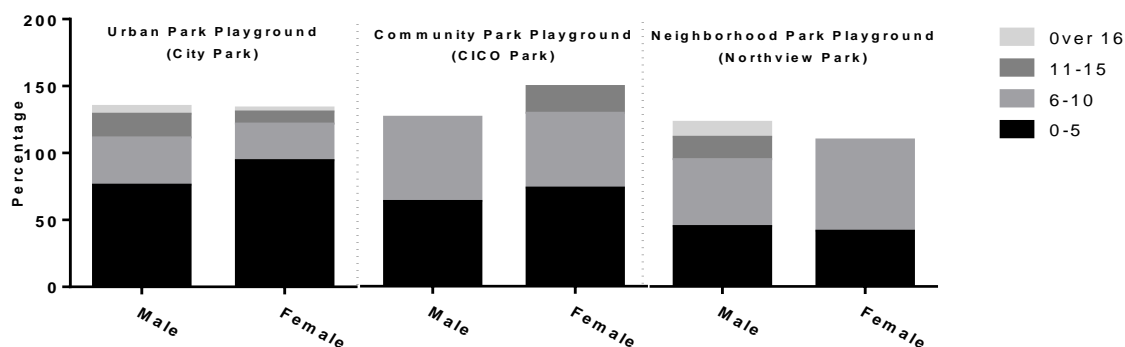


Figure 18 Parent gender and age group analysis

The low male parents' participation at all three playgrounds could mean different shares of family work between the two sexes, but it might also reflect the differences between playground program designs and their service target population.

To find out more about this phenomenon, this study looked into parent gender data and their children's age group in the urban park playground. Figure 18 show that 31 out of 33 female parents had at least one child from the 0 to 5 age group, which means 94% of female parents used the playground with children aged between those ages. 27% female parents visited the playground with children between 6 to 10 years old. Only 9.1% female parents visited the playground with children between 6 to 10 years old. Only 9.1% female parents visited the playground with children from the 11 to 15 age group. For male parents at the urban park playground, 71% visited the playground with children from 0 to 5 age group. Of this group, 35.3% of them also visited the playground with children from the 6 to 10 age group, and 17.6% of them visited the playground with children from the 11 to 15 age group. For the urban park playground, male parents are more likely to visit the playground with older children and female parents are more likely to visit the playground with younger children aged zero to five.

The same parent gender and children's age group analysis of the community park playground showed that male parents are more likely to visit the playground with older children.

The same analysis of the neighborhood park playground showed no apparent patterns similar to the other playgrounds.

4 PLAYGROUND UTILIZATION BY AGE GROUP

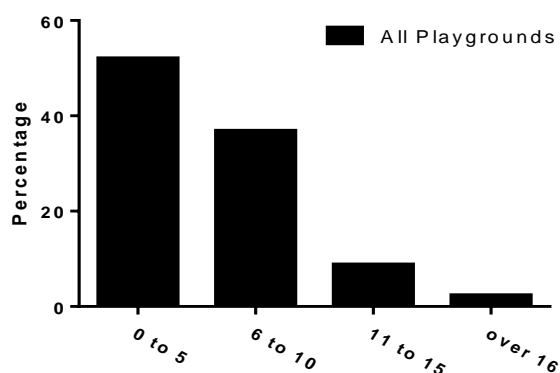


Figure 19 Age group utilization at all playgrounds

For all three playgrounds, the 0 to 5 and 6 to 10 age groups were the two primary playground users; however, the 11 to 15 age group had a significantly smaller population. The difference between the 6 to 10 and 11 to 15 age group was 28.07%.

For each playground, it seems the urban park playground suffered most from the low participation of the 6 to 10 age group. All playgrounds had a very low participation of children aged 11 to 15. All play equipment is designed for children under 12, but playgrounds should consider the needs of this age group. They also need play opportunities going into their adulthood, but the 13 to 15 age group had almost no interest in these playgrounds. The underutilization for the 11 to 15 age group exists.

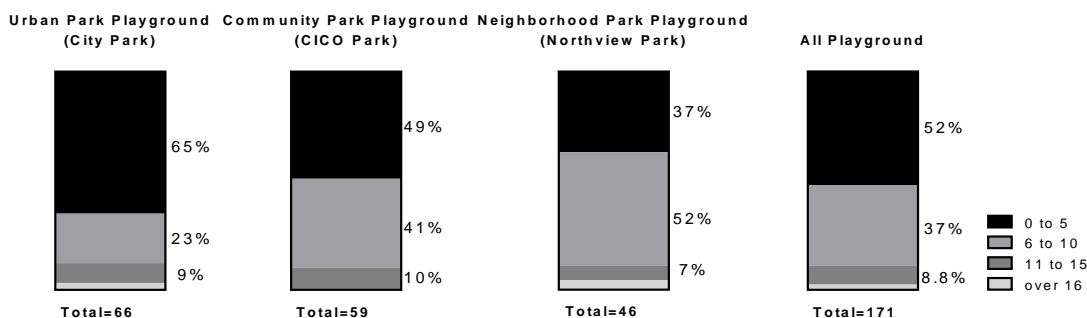


Figure 20 Age group utilization

Age Group Difference	Urban Park Playground	CICO Park Playground	Northview Playground
0-5 to 6-10	42.42%	8.5%	-15.22%
6-10 to 11-15	13.64%	30.5%	45.65%

Table 9 Age group population difference

0 to 5 age group has the largest population at the urban park and community park playgrounds during the survey. This age group was 42% larger than the 6 to 10 age group at the urban park playground. That difference at the community park playground is only 8%. At the neighborhood park playground, 0 to 5 age group is 15% smaller than 6 to 10 age group. At all three playgrounds, 11 to 15 age groups had the smallest population, which was 7% at the neighborhood playground, 10% at the community park playground, and 9% at the urban park playground. Since the survey was done on weekends, busy schedules could not explain the age group differences. Low participation of 6 to 10 and 11 to 15 age groups at selected urban park playgrounds might suggest an underutilization, but more studies are needed to confirm the problem. The selected neighborhood park playground also has cookie-cutter play equipment, but 6 to 10 age group playground utilization is higher than the 0 to 5 age group. It seems that better accessibility could compensate for the playground utilization a little bit. More studies are needed to find out why. The underutilization for the 11 to 15 age group is apparent in all three playgrounds.

The significant differences of age group participation could suggest play equipment is more appropriate for younger children under five. As children grow older, they start to lose interest in our playgrounds. Designed for children 0 to 12, play equipment on these playgrounds only provides raw motor skill stimuli on fixed cookie-cutter play equipment, which is insufficient for the development of children of all ages. Unlike children under five, older children are more likely to reject boring play equipment and look for new stimuli (Berlyne, 1960). It is very likely that play equipment design neglected the advanced needs for older children, who need more physically challenging play equipment and more developmental stimulations from creative designs. These play equipment characteristics are equally or even more important for younger children (Davies, 1996).

5 OVERALL PLAYGROUND SATISFACTION AND UTILIZATION FREQUENCY

Overall, 42.7% and 14.5% people rated playgrounds “Satisfied” and “Very satisfied” in a 1 to 5 rating scale, which is a 57.2% combined total; 1.5% and 3.8% of survey participants are very unsatisfied and unsatisfied; and 35.1% participants think they were somewhat satisfied (Figure 21).

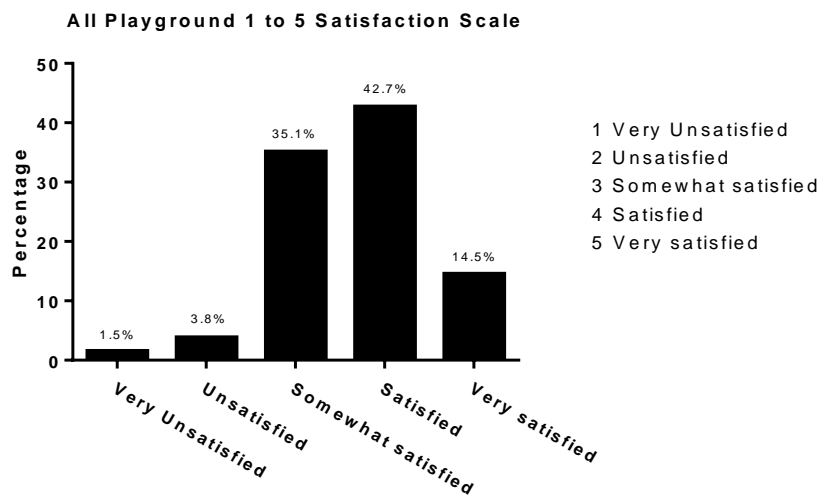


Figure 21 Overall playground satisfaction scale of all playgrounds

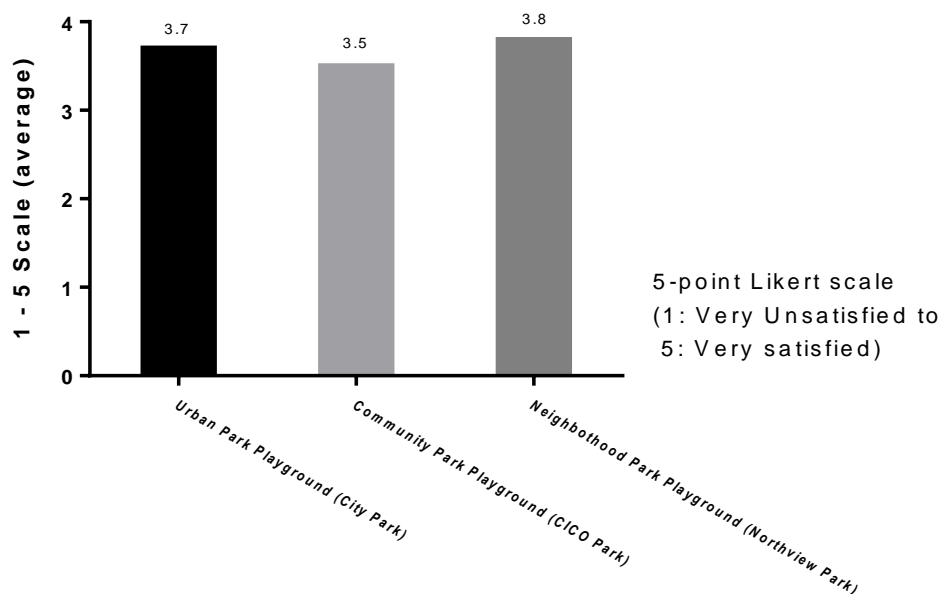


Figure 22 Overall satisfaction 1 – 5 scale for each playground

Figure 22 shows that — despite the difference of play equipment, on-site amenities, size and condition — all selected playgrounds got similar ratings. Table 10 shows that at the urban park playground, 58% of participants were satisfied and very satisfied with the playground they

visited, but as many as 40% of the people rated the playground unsatisfied and somewhat satisfied. At CICO Park playground, 49% of participants were satisfied and very satisfied with the playground, but at the same locale 49% of the people were very unsatisfied, unsatisfied and somewhat satisfied. 2% participants did not give any ratings. At Northview playground, 65% of participants rated the playground satisfied and very satisfied; 32.5% participants rated the playground very unsatisfied and somewhat satisfied.

With a relatively high percentage of very unsatisfied, unsatisfied, and somewhat satisfied ratings, it is still too risky to say all three playgrounds are free from problems. So this study looked at playground visit frequency together with visitors' playground ratings. Taking the urban park playground for instance, it seems the high playground rating does not necessarily mean frequent playground visitation. Occasional and monthly playground visitors represent a large portion of the survey no matter what ratings people gave.

Urban Park Playground Visit Frequency by Rating			
	Somewhat satisfied	Satisfied	Very satisfied
Rarely	5.6%	0%	0%
Occasionally	44.4%	28.6%	25.0%
Monthly	5.6%	14.3%	25.0%
Weekly	38.9%	42.9%	37.5%
Daily	5.6%	14.3%	12.5%

Table 10 Urban park playground visit frequency by rating

Urban Park Playground Utilization Frequency by Rating

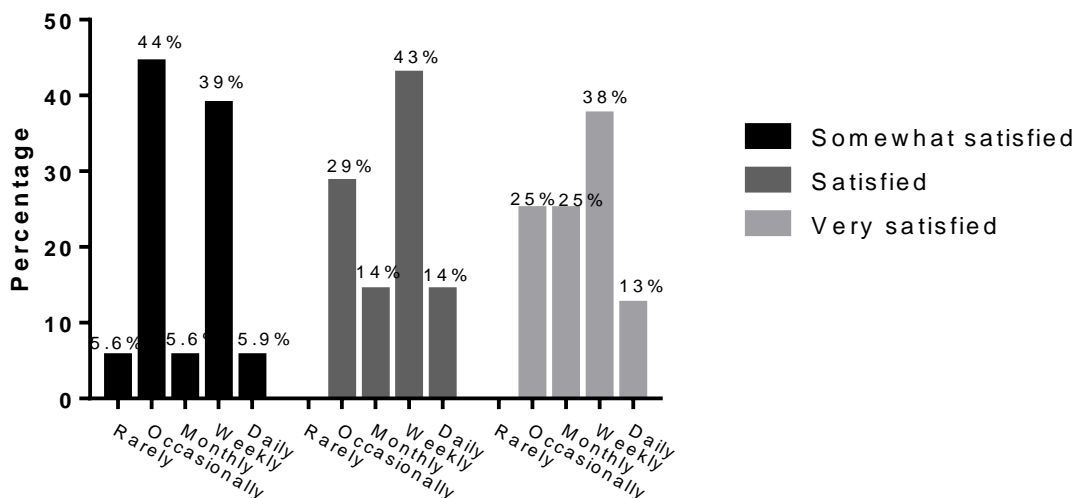


Figure 23 Urban park utilization by rating (City Park)

As Figure 23 shows, for the urban park playground, among people rating it “Very satisfied”, only 13% are daily visitors of the playground and 37.5% are weekly visitors. Half visit the playground monthly or even less. Similarly, among 21 people rating “satisfied”, only 14.3% are daily users and 42.9% are weekly users; 42.9% of them use the playground monthly or even less. Noticeably, all rating groups have very high percentage of occasional playground users. This was especially the case for people rating playgrounds “Somewhat satisfied”.

The results indicate the sole satisfaction rating does not reflect high playground utilization, meaning the high playground rating does not necessarily mean high playground utilization. This may indicate that playground utilization (frequency) is not completely decided by the satisfaction rating, but is also influenced by family schedules. Since the cost of playground utilization is zero, people only need to weigh between what playgrounds could offer to their children and what the family really needed to do during a day. Some research reported that playground conditions improvements also slightly increase playground utilization, but it is not a significant increase (Bohn-Goldbaum et al., 2013; Rung et al., 2011; Silver et al., 2014).

The high percentage of “occasional use phenomenon” could be a symptom of low playground utilization.

Now, let us look at more detailed utilization frequency data at playgrounds. Figure 24 shows the percentage of each utilization frequency group at three playgrounds.

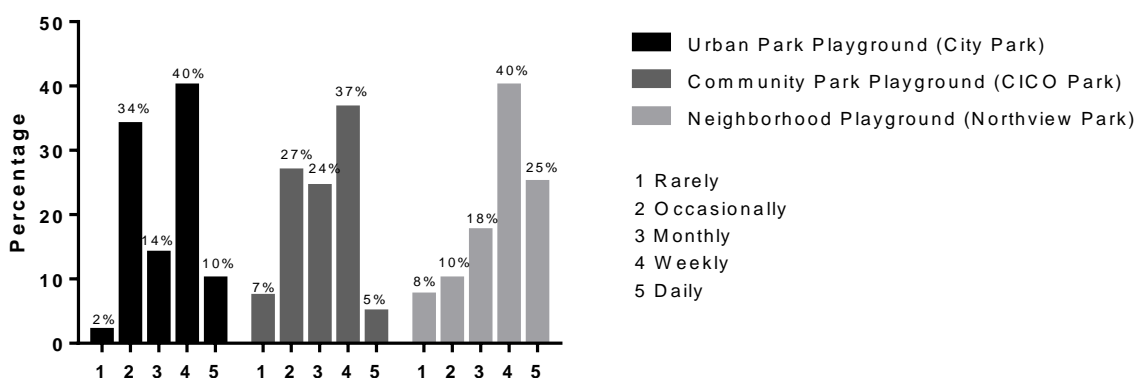


Figure 24 Playground utilization frequency

For all three playgrounds, around 40% of people make weekly playground visits. This makes sense when two parents need to work during weekdays. Daily playground visits are usually generated from home-schooling families. In the urban park playground, 50% of visitors only visit the playground monthly or less. The percentages in community and neighborhood park playgrounds are 58% and 35%, which is not a small percentage for all playgrounds. In order to increase playground utilization, some further study needs to be done on these infrequent visitor groups.

6 CORRELATION ANALYSIS

a. Playground Rating and Playground Utilization Frequency

In order to see the playground visitation patterns, some correlation analysis is needed to see if there is any connection between overall playground satisfaction and utilization frequency.

Playground rating is the 1 to 5 satisfaction rating given by survey participants. The playground

utilization is the survey participants' playground visit frequency. The question is if there is a correlation between the two variables.

Playgrounds	Spearman Coefficient (r/p-Value)	Pearson Coefficient (r/p-Value)	Significance of correlation
Urban park playground (City Park)	0.18/0.23	0.17/0.24	no correlation
Community park playground (CICO Park)	0.13/0.44	-0.01/0.97	no correlation
Neighborhood park playground (Northview Park)	0.01/0.94	0.07/0.66	no correlation

Note: This study used Spearman's correlation analysis and confirmed results with Pearson's correlation analysis.

Table 11 Correlation between playground rating and utilization frequency

Table 11 shows that at all three playgrounds, there is no correlation between playground satisfaction rating and playground utilization frequency. This confirms that high playground ratings do not necessarily lead to high playground utilization frequency.

b. Individual Play Equipment Analysis

This study also looked into individual play equipment and tried to find out whether or not a correlation exists between satisfaction rating and utilization frequency for each individual playground equipment. This is important because individual play equipment contribute to the interestingness of the whole playground. When parents make family schedules, they have to weigh between playground visits and other family tasks to see if the playground is worth a daily, weekly, or even monthly visit.

Urban Park Playground (City Park)					
Play equipment on-site	n	r	p-value	Significant	Condition
Slides	48	.622**	0.000	Y	3
Climbing equipment	47	.576**	0.000	Y	4
Tornado spinner	48	.597**	0.000	Y	4
Pretend play	50	.529**	0.000	Y	3
Play structure as a whole	50	.241	0.091	N	4
Slides utilization and satisfaction	50	.400	0.004	Y	2

Pretend play	50	.206	0.151	N	2
Play structure as a whole	50	.067	0.645	N	2
Belt swings	49	.493**	0.000	Y	4
Safe swings	49	.667**	0.000	Y	3
Bucket swings	49	.450**	0.001	Y	4
Balance beam	50	.471**	0.001	Y	4
Spring rocker	50	.359*	0.010	Y	3
Sandbox	50	.219	0.126	N	2
Water pad	50	.542**	0.000	Y	4
Rope climber	50	.663**	0.000	Y	5
Rock climber	50	.700**	0.000	Y	5

Note: Conditions: 1 to 5, higher is better

Table 12 Equipment satisfaction and utilization correlations at community park playground

Community Park Playground (CICO Park)					
Play equipment on-site	n	r	p-value	Significant	Condition
Slides	40	.442**	0.004	Y	3
Climbing equipment	40	.589**	0.000	Y	2
Play structure as a whole	40	.400*	0.010	Y	2
Slides utilization and satisfaction	40	.321*	0.044	Y	3
Separate slide	40	.340*	0.032	Y	5
Monkey bars	40	.336*	0.034	Y	4
Play structure as a whole	40	.388*	0.013	Y	4
Belt swings	41	.493**	0.001	Y	4
Bucket swings	41	.391*	0.011	Y	4
Spring rocker	40	.482**	0.002	Y	4
Sandbox	39	.595**	0.000	Y	3
Merry-go-round	41	.226	0.154	N	2
Climbing cage	41	-.182	0.256	N	2
Sound play equipment	41	.589**	0.000	Y	4
Cave	40	.486**	0.001	Y	3
Vending wagon	40	.651**	0.000	Y	2
Indian tent	40	.667**	0.000	Y	2
Wagon	40	.525**	0.001	Y	2
Canon	40	.578**	0.000	Y	2

Note: Conditions: 1 to 5, higher is better

Table 13 Equipment satisfaction and utilization correlations at community park playground

Neighborhood Park Playground (Northview Park)					
Play equipment on-site	n	r	p-value	Significant	Condition
Slides	38	.323*	0.048	Y	3
Climbing equipment	38	0.169	0.312	N	5
Tornado spinner	38	.344*	0.035	Y	5
Pretend play	38	.566**	0.000	Y	4
Play structure as a whole	38	.205	0.216	N	4
Belt swings	38	.414**	0.010	Y	5
Safe swings	38	.416**	0.009	Y	3
Climbing cage	38	.566**	0.000	Y	5
Separate spinner (Sky Runner)	38	.446**	0.005	Y	5

Note: Conditions: 1 to 5, higher is better

Table 14 Equipment satisfaction and utilization correlations at neighborhood park playground

Tables 12 to 14 show the correlation analyses for play equipment utilization frequency and their satisfaction ratings at all three playgrounds. For most play equipment, correlation exists between play equipment utilization frequency and satisfaction ratings. There are several exceptions on all playgrounds, but the correlations between play equipment utilization frequency and their satisfaction rating is evident. One thing in common for all exceptions is that they all have inferior conditions than other play equipment. This might indicate that people use the play equipment a lot but they give it low ratings due to its poor upkeep.

The correlation analyses suggest that a playground's equipment satisfaction rating and its utilization frequency is correlated. Better playground equipment design will lead to higher equipment utilization. A noticeable fact is that two play structures from two playgrounds show no correlation between satisfaction rating and utilization frequency, and the condition rating are high. This might suggest that these play structures are not utilized for their high rating and good conditions, but only because there are no other choices available. Further research needs to be done to find out more evidence for this phenomenon.

c. Utilization Frequency, Satisfaction Rating, and Play Equipment Condition

Play equipment condition is a very important factor that affects play equipment utilization, but is there a correlation between the two at selected playgrounds? The following data will reveal the effect of play equipment condition on play equipment utilization frequency, and user rating on each playground equipment.

Play Equipment Condition and Its Utilization Frequency			
	Urban Park Playground (City Park)	Community Playground (CICO Park)	Neighborhood Park Playground (Northview Park)
r	-0.474	.180	0.000
p-Value	.054	.461	1.000

Table 15 Correlation between play equipment condition and utilization frequency

The table 15 show a marginal correlation between play equipment condition and its utilization frequency at the urban park playground. The correlation does not exist at other selected playgrounds. This phenomenon could mean that play equipment condition is not a major factor that affects play equipment utilization when the play equipment is in reasonably good condition. If play equipment deteriorates to an unacceptable condition that compromises its usability, the condition factor will show stronger effects on utilization. Junk yard playgrounds used to be popular from the 1930s to 1950s. Performance of those playgrounds cannot be measured by the cleanliness and conditions, because all play materials were broken and basically junk. Sometimes poor upkeep may not hurt the usability of play equipment. People are more likely to use interesting play equipment with poor conditions than to use boring play equipment with excellent conditions. This proves that play equipment is the primary factor that affects playground utilization level. Conditions' effects on all selected playgrounds are weak, which might show that all three playgrounds are decently maintained and have no outstanding condition problems.

Play Equipment Condition and Satisfaction Rating			
	Urban Park Playground (City Park)	Community Playground (CICO Park)	Neighborhood Park Playground (Northview Park)
r	.592**	.690**	.956**
p-Value	0.008	0.000000	0

Table 16 Correlation between play equipment condition and rating

Table 16 indicates that play equipment satisfaction rating and play equipment condition are strongly correlated in all three playgrounds. People tend to give poor ratings to play equipment they like if that equipment is in poor condition, but the poor rating and condition do not necessarily affect play equipment utilization. Most importantly, neighborhood park users are more likely to be sensitive about equipment condition in consideration of their satisfaction levels than those from community and urban park users. It seems that the upkeep of neighborhood park playgrounds is as important as the upkeep of urban park playground and community park playground.

7 PLAY EQUIPMENT PREFERENCE AND PLAYGROUND VISIT FREQUENCY

In order to find out what type of play equipment attracts people to playgrounds, this study also looked at the connection between playground visit frequency and play equipment preferences. This survey has divided playground visitors into five categories: 1: Daily, 2: Weekly, 3: Monthly, 4: Occasionally, and 5: Rarely. This classification was regrouped into two types of visitors: Frequently and Occasionally (Table 17).

1	Rarely	Occasional Playground Users
2	Occasionally	
3	Monthly	Frequent Playground Users
4	Weekly	
5	Daily	

Table 17 Reclassification of playground utilization frequency for playground users

Play equipment utilization frequency was also classified into five categories: 1: Never, 2: Rarely, 3: Sometimes, 4: Very often, and 5: Always. The mean of the utilization frequency was calculated and used in this preference analysis. This study looked at what equipment was most frequently used by each group of visitors. The following table gives results of the analysis.

Urban Park Playground (City Park)		
	Frequent Playground Visitors	Occasional Playground Visitors
	Utilization Frequency	Utilization Frequency
Sample Size	25	25
Slides	3.84	3.64
Climbing equipment	3.16	3.56
Tornado spinner	3.12	3.28
Pretend play	3.24	3.2
Whole structure	4.16	4.4
Toddler slides	4.00	3.24
Toddler pretend play	3.28	3.04
Toddler whole structure	4.16	3.56
Belt swings	3.42	3.6
Safe swings	3.12	3.04
Bucket swings	2.75	2.2
Balance beam	2.6	2.72
Spring rocker	3.24	2.92
Sandbox	3.36	3.32
Water pad	3.2	2.72
Rope climber	2.76	3.08
Rock climber	2.92	2.72

Note: 1:Rarely 2:Occasionally 3:Monthly 4:Weekly 5:Daily

Table 18 Playground utilization frequency and play equipment preference

Community Park Playground (CICO Park)		
	Frequent Playground Visitors	Occasional Playground Visitors
	Utilization Frequency	Utilization Frequency
Sample Size	17	24
Slides	3.82	3.00
Climbing equipment	3.94	2.96
Whole structure	3.88	3.57

Toddler slides	4.00	3.26
Toddler separate slide	3.29	3.30
Toddler monkey bars	2.82	2.91
Toddler whole structure	3.71	3.35
Belt swings	4.24	3.83
Bucket swings	4.24	3.46
Balance beam	n/a	n/a
Spring rocker	3.35	2.67
Sandbox	3.29	2.29
Merry-go-round	3.82	4.13
Climbing cage	3.06	3.46
Sound play equipment	3.65	2.25
Cave	4.29	3.50
Vending wagon	3.35	2.50
Indian tent	3.18	2.21
Wagon	3.29	2.63
Canon	3.24	2.13

Note: 1:Rarely 2:Occasionally 3:Monthly 4:Weekly 5:Daily

Table 19 Playground utilization frequency and play equipment preferences

Neighborhood Park Playground (Northview Park)			
	Frequent Playground Visitors		Occasional Playground Visitors
	Utilization Frequency		Utilization Frequency
Sample Size	25		14
Slides	4.48		3.86
Climbing equipment	3.32		3.36
Tornado spinner	4.08		3.50
Pretend play	2.72		2.79
Whole structure	4.32		4.36
Belt swings	4.04		4.00
Safe swings	2.8		3.00
Climbing cage	3.56		3.21
Separate spinner (Sky Runner)	3.72		3.79

Note: 1:Rarely 2:Occasionally 3:Monthly 4:Weekly 5:Daily

Table 20 Playground utilization frequency and play equipment preferences

Table 18, 19, 20 show that frequent playground visitors are more likely to use all play equipment and also a little less likely to use physically challenging equipment. Occasional

visitors are more likely to use physically challenging play equipment than frequent playground visitors. Also, occasional playground visitors are not interested in as many different pieces of play equipment on playgrounds as frequent playground users are. This might suggest occasional playgrounds users do not visit playgrounds very frequently because playgrounds are boring to them.

To increase playground visit frequency, municipalities may need to increase the physically challenging, moving creative play equipment. To maintain the playground utilization level, municipalities should provide cutting-edge free-play equipment with creative design or loose parts. Sandbox is the all-time favorite play equipment for children to create something of their own. Sandboxes are safe and relatively inexpensive to build, but a quality sandbox should provide decent size, depth, and attractive sand toys.

8 PLAYGROUND DESIGN PREFERENCES

Asked their favorite things about the playgrounds they visited in general, survey participants are actually asked to identify both playground strengths and weaknesses. Since all three playgrounds have similar play equipment and design concepts, data from the three playgrounds was put together and generated the following chart. The higher percentage indicates a better situation.

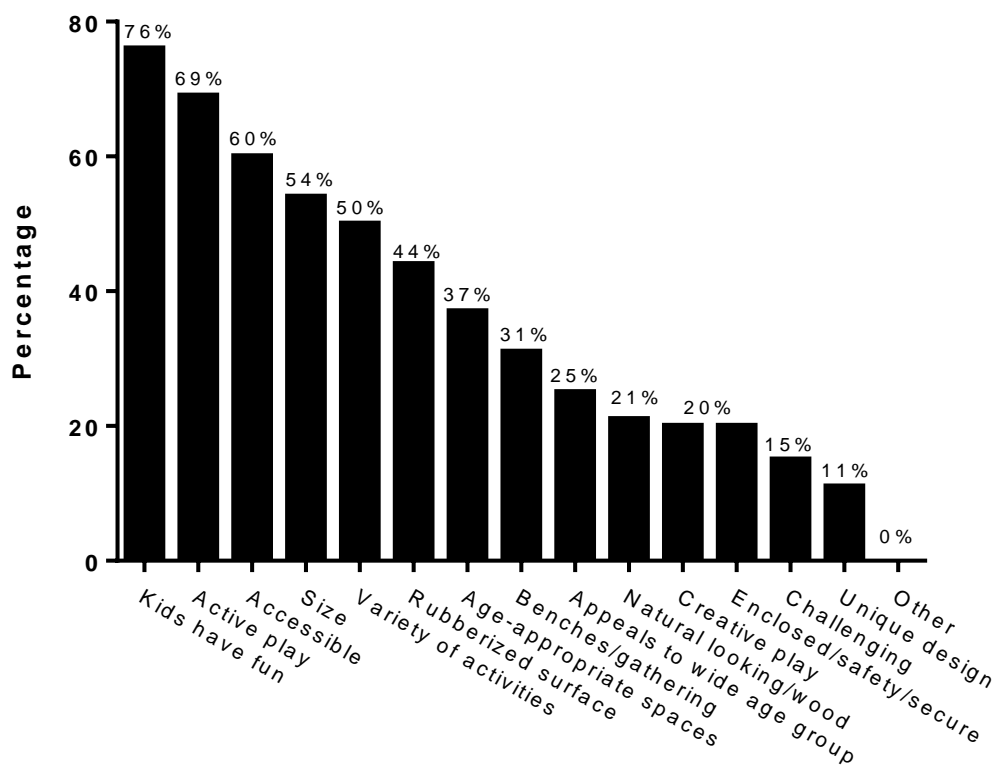


Figure 25 Playground users' favorite elements for all playgrounds

Among 14 playground design criteria, only 11% of people think the selected playgrounds have a unique design. Only 20% of people agree that the playground provided creative play opportunities. 15% of people think the playground is challenging; 21% of people think the playground has a natural looking design; and only 25% of people think the playground is designed for a wide range of age groups.

Asked about least favorite playground elements, survey participants were able to double confirm playground strengths and weaknesses. Data from all three playgrounds were examined together due to the similar playground designs. This time the higher percentage indicates a worse situation.

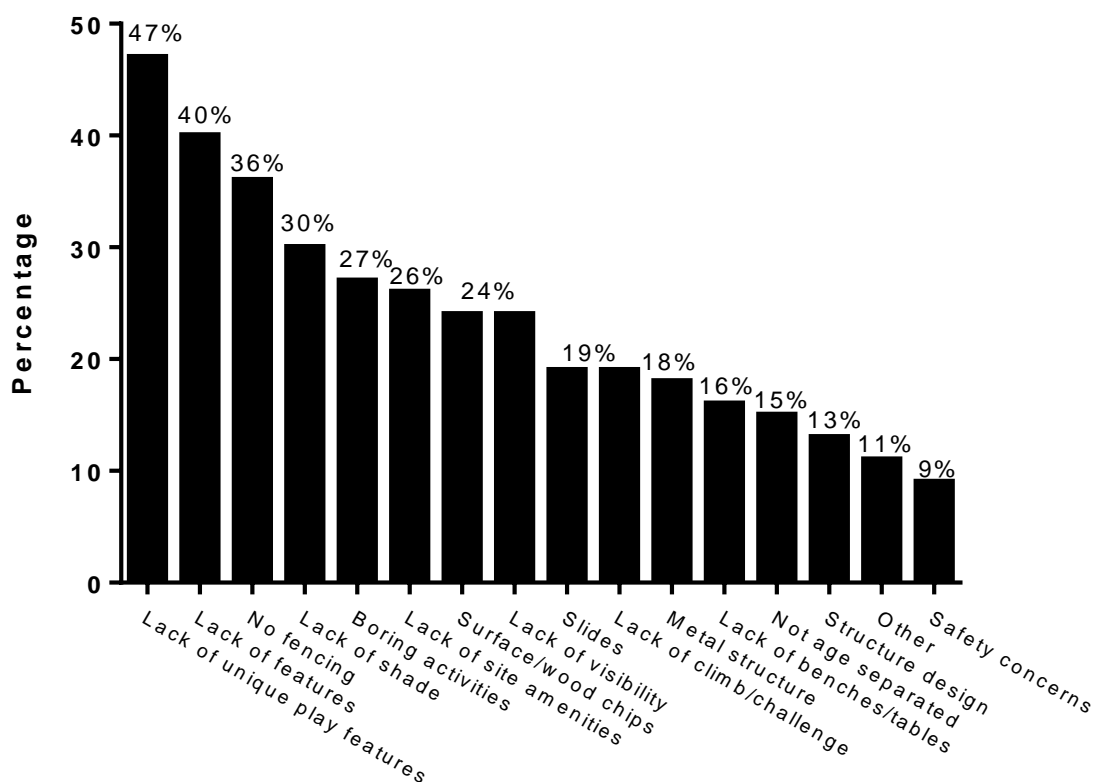


Figure 26 Playground users' least favorite playground elements

In Figure 26, 47% of people think the playgrounds lack of unique designs; 40% think there is a lack of play equipment; 30% of survey participants think the playground lacks of shade; 36% believe no fencing around playgrounds is a problem; 26% think there is a lack of site amenities; 27% think playground activities are boring; and only 9% have safety concerns.

This set of data show that people expect more creative play equipment and more unique designs on all studied playgrounds. The current playground provision partially meet the needs, but problems are also outstanding in many aspects. There is plenty of room to improve play equipment and increase playground utilization.

9 EXPECTATIONS FOR PLAYGROUNDS

The survey also asked playground users' expectations for future playground improvements.

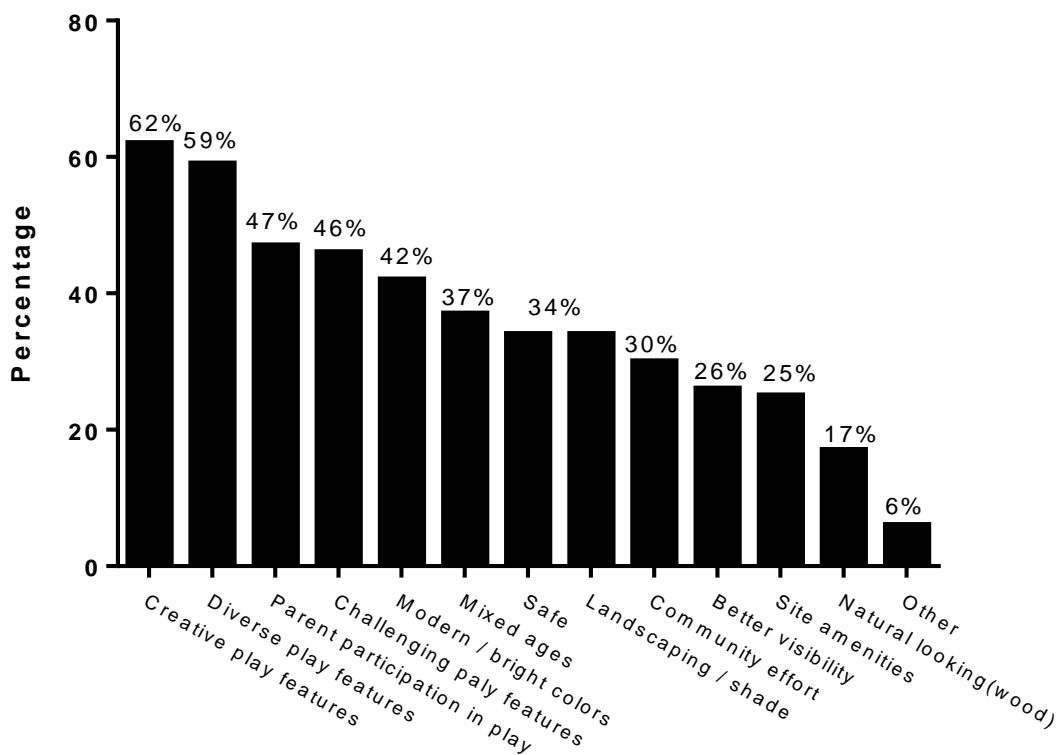


Figure 27 Expectations for playground improvements

In Figure 27, both 56% and 62% of survey participants expect to see diverse and creative play equipment at playgrounds. 46% of survey participants expect playgrounds to be more challenging; 47% people would like to have parent participation in play; and 37% of participants want play equipment to attract mixed age groups. Modern and bright colors are also expected from 42% of survey participants.

To sum up, most people are expecting diverse, creative, and challenging play equipment on their playgrounds. Safety is not the first priority in the playground demand.

CHAPTER 5 CONCLUSION

1 SUMMARY OF RESULTS

With the help of the playground audit and survey, this study not only collected data about playground utilization and satisfaction, but also about play equipment utilization frequency, play equipment satisfaction, etc. to fully grasp the playground utilization status in the study area.

This study found no correlation between playground utilization frequency and playground satisfaction. Current playground utilization remains at a certain level much likely due to the rigid demand for playground use; data also show there is playground underutilization for the 6 to 10 and 11 to 15 age groups at all three types of playgrounds. Data also revealed that collective individual play equipment has a connection with playground utilization frequency — rare and occasional playground visitors are more likely to be attracted to play equipment with moving parts, higher physical challenges, and creative designs. This study concluded that manufactured playground equipment could not meet advanced play needs for older children. The continued provision of such manufactured equipment should be carefully considered.

This study reviewed some of the most important history of playgrounds; summarized the challenges and problems that playgrounds are facing; and examined research findings in other sciences supporting the building of creative playgrounds.

Overall, this study concluded that by meeting the high demand of creative and challenging play equipment, municipalities may increase the playground utilization. It is quality playground design and playground equipment that really affects playground utilization.

Play equipment satisfaction ratings showed a strong tendency to correlate with the play equipment utilization frequency. Characteristics of a piece of play equipment decides its

utilization. Conditions of the play equipment has no correlation with its utilization, as long as the equipment is still usable and reasonably safe. The existing play equipment in Manhattan city parks has a high utilization level from 0 to 5 age group, but shows a sharp utilization reduction from 6 to 10 and 11 to 15 age group. During the playground survey, frequent play equipment misuses were observed from all age groups, indicating a lack of challenging and creative play equipment on these playgrounds. Such equipment misuses include climbing up slides, climbing to the top of the structures, vigorous running and chasing, twisting swings, and jumping off moving swings. Playground assessment in the survey also confirmed that people think the three typical playgrounds lack creative and unique design. This study also found that play equipment condition and upkeep are not decisive factors that affect overall playground utilization and individual play equipment utilization.

Among the three playground types, the urban park playground is utilized at a moderately high volume, but the survey did record negative opinions about certain aspects of this playground equipment and characteristics. In the community park playground, survey participants did not express any strong opinions against dangerous vintage play equipment. On the contrary, some parents expressed their love for this challenging play equipment and expressed sorrow at seeing the disappearance of those elements. Aside from the poorly kept up vintage play equipment, the community park playground scored a similar overall rating as the other playgrounds. The individual play equipment in the community park playground also got similar satisfaction ratings as other playgrounds. Despite missing playground amenities, Northview playground got the highest overall ratings among all selected playgrounds. This phenomenon could mean that a large part of its playground utilization might be the result of rigid playground demands rather than the attraction of playground equipment.

2 IMPLICATIONS

a. Playground Design

Play is a complicated human activity. The complexity of play would should be reflected in the play environment design. Therefore, children's play cannot be well satisfied through modularized, fixed, and standardized structures placed on a patch of cushioned ground.

Playgrounds cannot be mass produced in factories and sold as consumer products. Susan Solomon pointed out in her book, *The Science of Play*, that such manufactured playgrounds are non-design designs, which are actually shaped to avoid liabilities and maximize durability. She also pointed out that ever-growing safety measurements have made play equipment extremely expensive, not to mention the cost to upgrade existing equipment to comply with new safety standards. There was a time when playgrounds were actually designed by architects and landscape architects. The goal is to make an interesting place to attract, inspire, and challenge children to play. But the movement failed to gain popularity due to the cost of maintenance (Solomon, 2005, 2014).

To improve playground design, municipalities could choose to increase the size of the playground and provide bigger play structures and more play equipment. However, this method seems to have reached its limit. As the results showed, more play equipment does not necessarily increase playground satisfaction ratings. Playgrounds of all types were considered to have a lack of unique design and creative play equipment by playground users. What children really need is play opportunities. Sand piles, little rocky mountains, artificial pebbled-bedded pond or rivers, and artistic landforms are all play opportunities (Kingery-Page & Melvin, 2013; Stagnitti, 2004). Manufactured, standard, and fixed playground equipment is too monotonous for children.

Feeding fish in a pond or collecting pebbles in shallow water, playing hide-and-seek in a bush maze, and building a sand castle could all be parts of playground program designs.

b. Planning Policy

To embrace play opportunities rather than just more play equipment is a drastic transition in municipalities' playground provisions.

The first solution is the coexistence of two play systems. Municipalities could gradually integrate play opportunities into parks and let current playgrounds coexist with newly introduced creative play opportunities. More research could be conducted to compare the performance of the two.



Figure 28 A playable bus stop (Playful City USA, 2015)

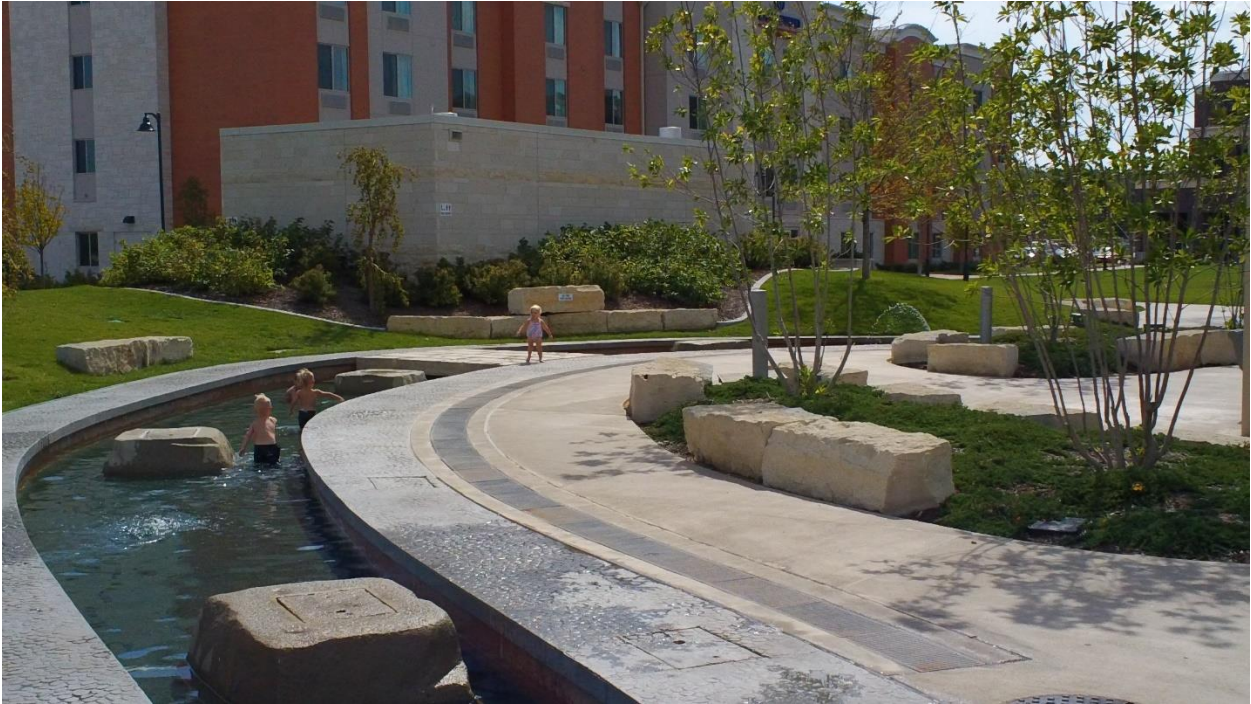


Figure 29 Konza Plaza, Manhattan, Kansas (Yao, 2015)

The second solution is to embrace the concept of a playful city. A playful city could allow play to happen at any urban location with playful designs. Play opportunities are to be integrated to urban designs. Figure 28 shows a playable bus station. Square fountains with a sand-bedded artificial river is a good application of such urban design policy. The Konza Plaza (Figure 29) in front of Discovery Center, Manhattan Kansas, is a perfect example of such design. The playability can be used to measure the success of urban designs. Municipalities, private sectors, and designers could collaborate closely to provide playful elements at every corner of the city to increase playability of a city. Municipalities could use incentive policies to encourage developers to provide creative playful elements as part of the project. The amenity could then be maintained by the city or the project owner, depending on negotiations between the city and the interest parties.

3 LIMITATIONS

The study collected 131 survey forms from the study playgrounds, which is a rather small sample size for a correlation study. All survey forms were collected on site; therefore, the study does not reflect whether there are people who never use playgrounds in the community. For the same reason, rare playground users were not well enough represented in the survey data. Feedback from non-playground users is completely missing in this study.

The study did not examine the individual play equipment's attraction that contributes to playground visitation frequency. The play equipment's effect on playground utilization is not fully studied. More research is needed to find out about motivation of play equipment utilization.

There are 17 playgrounds within the city limits of Manhattan. This study only looked at an urban park playground, a community park playground, and a neighborhood park playground. The sampled playgrounds might not accurately profile playground utilization in the study area.

4 FUTURE STUDY

This study mainly looked at playground utilization frequency and statistics related to playground utilization. However, playground utilization has multiple implications. Children's playground utilization behavior is one of them. Children's play behavior at manufactured playgrounds could reveal relevant information about playground performance and user preferences. Are children really interested in our playgrounds? Are they getting bored very quickly on our playgrounds? How long do they usually stay at a playground? Are they sedentary or active? Answers to these questions could help us understand what to provide for our playgrounds in the future.

REFERENCES

- Albert, G., Abo-Kalla, H., & Baron, M. (2011). Transport and Environmental Variables and the Impact of Cultural Differences on Playground Use. *Journal of Urban Planning and Development*, 137(3), 291–297. doi:10.1061/(ASCE)UP.1943-5444.0000064
- Anderson, S. E., Economos, C. D., & Must, A. (2008). Active play and screen time in US children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: a nationally representative cross-sectional analysis. *BMC Public Health*, 8(1), 366. doi:10.1186/1471-2458-8-366
- Arvid, B. (1973). *Adventure Playgrounds*. Stockholm: Praeger.
- Barbour, A. C. (1999). The impact of playground design on the play behaviors of children with differing levels of physical competence. *Early Childhood Research Quarterly*, 14(1), 75–98. doi:10.1016/S0885-2006(99)80007-6
- Beckwith, J. (2000). No More Cookie Cutter Parks. *Berkeley Partners for Parks*, 1–7. Retrieved from <http://www.bpfp.org/PlaygroundDesign/NoMoreCookieCutter.htm>
- beidatoys. (2015). a playstructure at a Chinese playground. Retrieved from http://www.beidatoys.com/products.php?s_id=4
- Berlyne, D. E. (1960). Conflict, arousal, and curiosity.
- Bohn-Goldbaum, E. E., Phongsavan, P., Merom, D., Rogers, K., Kamalesh, V., & Bauman, A. E. (2013). Does Playground Improvement Increase Physical Activity among Children? A Quasi-Experimental Study of a Natural Experiment. *Journal of Environmental and Public Health*, 2013. doi:10.1155/2013/109841
- Bundy, A. (2001). Measuring play performance. *Measuring Occupational Performance Supporting Best Practice in Occupational Therapy*, 89–102.

- Bundy, A. C., Naughton, G., Tranter, P., Wyver, S., Baur, L., Schiller, W., ... Brentnall, J. (2011). The Sydney playground project: popping the bubblewrap--unleashing the power of play: a cluster randomized controlled trial of a primary school playground-based intervention aiming to increase children's physical activity and social skills. *BMC Public Health*, *11*(1), 680. doi:10.1186/1471-2458-11-680
- Cardon, G., Cauwenberghe, E. Van, Labarque, V., Haerens, L., & Bourdeaudhuij, I. De. (2008). The contribution of preschool playground factors in explaining children's physical activity during recess. *International Journal of Behavioral Nutrition and Physical Activity*, *5*(1), 11. doi:10.1186/1479-5868-5-11
- Carolina, N., Learning, O., & Alliance, E. (1999). Professional Perspectives and Research on Children's Outdoor Environments.
- Chesterton, G. (1908). *All Things Considered*. London: Methuen & Co.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*, *5*(1), 68–80. Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:An+Investigation+of+the+Status+of+Outdoor+Play#0>
- Colabianchi, N., Kinsella, A. E., Coulton, C. J., & Moore, S. M. (2009). Utilization and physical activity levels at renovated and unrenovated school playgrounds. *Preventive Medicine*, *48*(2), 140–3. doi:10.1016/j.ypmed.2008.11.005
- Colabianchi, N., Maslow, A., & Swayampakala, K. (2011). Features and amenities of school playgrounds: A direct observation study of utilization and physical activity levels outside of school time. ... *and Physical Activity*, *8*, 32. doi:10.1186/1479-5868-8-32

- Cooper, C. (1970). *The adventure playgrounds: creative play in an urban environment* (No. 118). *Institute of Urban and Regional Development Working Paper 118*. Berkeley, California.
- CPSC. (2014). Public Playground Safety Handbook, 60. Retrieved from <https://www.cpsc.gov/PageFiles/122149/325.pdf>
- Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., ... Oja, P. (2003). International physical activity questionnaire: 12-Country reliability and validity. *Medicine and Science in Sports and Exercise*, 35(8), 1381–1395.
doi:10.1249/01.MSS.0000078924.61453.FB
- Cranz, G. (1982). The politics of park design. A history of urban parks in America. *The Politics of Park Design. A History of Urban Parks in America*. Retrieved from <http://www.cabdirect.org/abstracts/19831804774.html>
- Cunningham, C., & Jones, M. (1999). The playground: a confession of failure? *Built Environment*, 25(1), 11–17. doi:10.2307/23289138
- Davies, M. M. (1996). Outdoors: An Important Context for Young Children's Development. *Early Child Development and Care*, 115(1), 37–49. doi:10.1080/0300443961150104
- Ellis, M. J. (1973). Why people play.
- Fitzgerald, R. W. (2005). *Recreation & Leisure in Modern Society*. doi:10.1002/0470863285.ch3
- Frost, J. L., & Wortham, S. C. (1988a). The Evolution of American Playgrounds. *Young Children*, 43(5), 19–28. doi:10.4249/scholarpedia.30423
- Frost, J. L., & Wortham, S. C. (1988b). The Evolution of American Playgrounds. *Young Children*, 43(5), 19–28. Retrieved from <http://eric.ed.gov/?id=EJ373914>
- Frost, J., Wortham, S., & Reifel, R. (2008). *Play and child development*. Pearson/Merrill Prentice Hall Upper Saddle River, NJ. Retrieved from

http://www.journalofplay.org/sites/www.journalofplay.org/files/pdf-articles/1-1-book-review-3_0.pdf

- Gary, P. (2008). The Value of Play I: The Definition of Play Gives Insights. Retrieved December 27, 2013, from <http://www.psychologytoday.com/blog/freedom-learn/200811/the-value-play-i-the-definition-play-gives-insights>
- Gold, S. (1972). Nonuse of neighborhood parks. *Journal of the American Institute of Planners*, 38(6), 369–378. doi:10.1080/01944367208977640
- Gray, P. (2013). *Free to learn: why unleashing the instinct to play will make our children happier, more self-reliant, and better students for life*. New York: Basic Books. Retrieved from <http://www.amazon.com/gp/product/0465025994/>
- Hart, C. H. C., & Sheehan, R. (1986). Preschoolers' play behavior in outdoor environments: Effects of traditional and contemporary playgrounds. *American Educational Research Journal*, 23(4), 668–678. doi:10.3102/00028312023004668
- Hart, R. (2002). Containing children: some lessons on planning for play from New York City. *Environment and Urbanization*, 14(2), 135–148. doi:10.1177/095624780201400211
- Henniger, M. L. (1993). Enriching the Outdoor Play Experience. *Childhood Education*. doi:10.1080/00094056.1993.10521000
- Howard, D., & Crompton, J. (1984). Who are the Consumers of Public Park and Recreation Services? An Analysis of the Users and Non-Users of three Municipal Leisure Service Organizations. *Journal of Park and Recreation Administration*, 2(3), 33–48. doi:15.4.2010
- Hutt, C. (1966). Exploration and play in children (Vol. 18, pp. 61–81).

- Kingery-Page, K., & Melvin, R. J. (2013). Site as Experiential Playground: Artistic Research for a Learning Landscape. *The International Journal of Pedagogy and Curriculum*. Retrieved from <http://ijlpc.cgpublisher.com/product/pub.250/prod.58>
- Laursen, B., Hartup, W. W., & Koplas, A. L. (1996). Towards understanding peer conflict. *Merrill-Palmer Quarterly (1982-)*, 76–102.
- Lazarus, M. (1883). *Über die reize des spiels*. F. Dümmler.
- Martínez Vizcaíno, V., Salcedo Aguilar, F., Franquelo Gutiérrez, R., Solera Martínez, M., Sánchez López, M., Serrano Martínez, S., ... Rodríguez Artalejo, F. (2008). Assessment of an after-school physical activity program to prevent obesity among 9- to 10-year-old children: a cluster randomized trial. *International Journal of Obesity (2005)*, 32(1), 12–22. doi:10.1038/sj.ijo.0803738
- Masters, C. (2011). Boring playgrounds deprive kids. Retrieved from <http://www.dailytelegraph.com.au/news/nsw/boring-playgrounds-deprive-kids/story-e6freuzi-1111113822631>
- Matthews, S. (1985). Adventure playgrounds vs traditional playgrounds. Retrieved from <http://digitalcommons.unf.edu/etd/55/>
- Mott, A., Rolfe, K., James, R., Evans, R., Kemp, A., Dunstan, F., ... Sibert, J. (1997). Safety of surfaces and equipment for children in playgrounds. *The Lancet*, 349(9069), 1874–1876. doi:10.1016/S0140-6736(96)10343-3
- O'Shea, K. (2013). How We Came to Play: The History of Playgrounds -. Retrieved from <http://blog.preservationnation.org/2013/08/15/how-we-came-to-play-the-history-of-playgrounds/>


- Ovid. (1957). *The Loves: The Art of Beauty, The Remedies for Love, and The Art of Love*. (R. Humphries, Ed.). Indiana University Press. Retrieved from https://books.google.com/books?id=X_nz4SZje5IC&pgis=1
- Piaget, J. (1962). *Play, dreams and imitation* (Vol. 24). New York: Norton.
- Quigg, R., Reeder, A. I., Gray, A., Holt, A., & Waters, D. (2012). The effectiveness of a community playground intervention. *Journal of Urban Health, 89*(1), 171–184. doi:10.1007/s11524-011-9622-1
- Rung, A. L., Mowen, A. J., Broyles, S. T., & Gustat, J. (2011). The role of park conditions and features on park visitation and physical activity. *Journal of Physical Activity & Health, 8 Suppl 2*(Suppl 2), S178–87. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21918231>
- Seligman, M. E., & Csikszentmihalyi, M. (2000). *Positive psychology: An introduction*. (Vol. 55). American Psychological Association.
- Silver, D., Giorgio, M., & Mijanovich, T. (2014). Utilization patterns and perceptions of playground users in New York City. *Journal of Community Health, 39*(2), 363–371. doi:10.1007/s10900-013-9771-0
- Solomon, S. G. (2005). *American Playgrounds: Revitalizing Community Space*. UPNE. Retrieved from <https://books.google.com/books?hl=en&lr=&id=At4u5kwzS4UC&pgis=1>
- Solomon, S. G. (2014). *The Science of Play: How to Build Playgrounds That Enhance Children's Development* (Vol. 4). University Press of New England. Retrieved from <https://books.google.com/books?id=K7gvBQAAQBAJ&pgis=1>
- Spain, D. (2001). *How Women Saved the City*. U of Minnesota Press. Retrieved from <http://books.google.com/books?id=zKtcBIkwfQoC>
- Spencer, H. (1895). *The principles of psychology* (Vol. 1). D. Appleton.

- Stagnitti, K. (2004). Understanding play: The implications for play assessment. *Australian Occupational Therapy Journal*, (March 2003), 3–12. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1046/j.1440-1630.2003.00387.x/full>
- Taylor, D. E. (2009). *The Environment and the People in American Cities, 1600s1900s: Disorder, Inequality, and Social Change*. Duke University Press. Retrieved from <http://books.google.com/books?id=r8i-xIrryL4C>
- Theodore-roosevelt.com. (2015). Complete list of speeches of Theodore Roosevelt; theodore roosevelt; THEODORE ROOSEVELT; teddy roosevelt; roosevelt speeches; teddy roosevelt speech; presidential speech; president speeches. Retrieved March 14, 2015, from <http://www.theodore-roosevelt.com/trspechescomplete.html>
- USA, P. city. (2015, April). Playful City USA. Retrieved April 9, 2015, from http://kaboom.org/take_action/playful_city_usa
- Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2006). Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place*, 12(4), 383–393. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1353829205000195>
- Veitch, J., Ball, K., Crawford, D., Abbott, G., & Salmon, J. (2013). Is park visitation associated with leisure-time and transportation physical activity? *Preventive Medicine*, 57(5), 732–734. doi:10.1016/j.ypmed.2013.08.001
- Vygotskij, L. S. (2012). *Thought and language*. MIT press.
- Vygotsky, L. S. (1967). Play and its role in the mental development of the child. *Journal of Russian and East European Psychology*, 5(3), 6–18.

- Wang, Y., Monteiro, C., & Popkin, B. M. (2002). Trends of obesity and underweight in older children and adolescents in the United States, Brazil, China, and Russia. *The American Journal of Clinical Nutrition*, 75(6), 971–977. Retrieved from <http://ajcn.nutrition.org/content/75/6/971>
- WSJ. (2015). Do safety concerns make playgrounds less fun? Retrieved March 5, 2015, from http://online.wsj.com/community/groups/general-forum/topics/do-safety-concerns-make-playgrounds?dj_vote=33707
- Yao, K. (2015). Konza Plaza, Manhattan, Kansas.
- Young, T. (1995). Modern urban parks. *Geographical Review*, 535–551.

APPENDICES

A Playground Audit Form



Playground Audit Form

Name of college/university:	School of Planning, Architecture and Design, Kansas State University
Name of graduate student :	Kanglin Yao

Instructions

- Drive, bike, or walk around the playground to get a feel for what is there and in the surrounding neighborhood.
- Questions are grouped into sections in the order you might come across features in a park. However, you may need to switch between sections or pages as you complete the park audit. Therefore, it is important to look through the entire tool before you begin.
- When you are finished, go back and make sure you have completed all sections and questions.
- There is space at the end of each section where you can write down comments as you complete your audit. Margins or backs of the pages can be used to take notes, but make sure to transfer your comments into the answer spaces.
- If you see anything that requires immediate attention, contact the local parks department.

Section 1: Playground Information

Playground name: _____ **Observer:** _____

Playground address/location:

Were you able to locate a map for this playground? No Yes

Was the playground easy to find on site? No Somewhat Yes

Audit date (m/d/y): ___/___/_____

Comments on playground information:

Playground Audit Tool
Page 1 of 8

Section 3: Playground Activity Areas

This section asks about activity areas in the playground—for rating conditions of play equipment:

1. **If the play equipment is not available, please mark "x."**
2. If the play feature is available, please rank the ratings as 1, 2, 3, 4, or 5.

Rating classification:

1. **Very bad**
2. **Bad**
3. **Fair**
4. **Good**
5. **Very good**

Play Equipment	City Park playground	CICO Park playground	Northview playground
Slides			
Climbing features (monkey bars, etc.)			
Tornado spinner			
Pretend play			
Play structure as a whole			
Slide utilization and satisfaction			
Separate slide			
Monkey bars			
Pretend play			
Play structure as a whole			
Belt swings			
Safe swings			
Bucket swings			
Balance beam			
Spring rocker			
Sandbox			
Water pad			
Rope climber			
Rock climber			
Merry-go-round			
Climbing cage			
Sound play equipment			
Cave			
Vending wagon			
Indian tent			
Wagon			
Canon			
Separate spinner (sky runner)			

Section 4: Playground Quality and Safety

This section asks about factors related to comfort and safety when using the playground. Several questions include follow-up responses if you answered yes. There are spaces for comments at the end of the section.

When rating the quality and safety features of the park, please use the following definitions:

- **Useable:** Everything necessary for use is present and nothing prevents use (e.g., can get into restrooms, drinking fountains work, etc.).
- **Good condition:** It looks clean and maintained (e.g., minimal rust, graffiti, broken parts, etc.).

13. Are there public restroom(s) or portable toilet(s) at the playground?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are the restroom(s) useable?	<input type="checkbox"/> All or most are useable <input type="checkbox"/> About half <input type="checkbox"/> None or few are useable
Are they in good condition?	<input type="checkbox"/> All or most in good condition <input type="checkbox"/> About half <input type="checkbox"/> None or few in good condition
Is there a family restroom?	<input type="checkbox"/> No <input type="checkbox"/> Yes
Is there a baby change station in any restroom?	<input type="checkbox"/> No <input type="checkbox"/> Yes
14. Are there drinking fountain(s) at the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
How many different fountains are there? (i.e. units not spouts)	_____
Are the fountains useable?	<input type="checkbox"/> All or most are useable <input type="checkbox"/> About half <input type="checkbox"/> None or few are useable
Are they in good condition?	<input type="checkbox"/> All or most in good condition <input type="checkbox"/> About half <input type="checkbox"/> None or few in good condition
Are they near activity areas?	<input type="checkbox"/> All or most are near <input type="checkbox"/> About half <input type="checkbox"/> None or few are near
15. Are there bench(es) to sit on in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are the benches useable?	<input type="checkbox"/> All or most are useable <input type="checkbox"/> About half <input type="checkbox"/> None or few are useable
Are they in good condition?	<input type="checkbox"/> All or most in good condition <input type="checkbox"/> About half

	<input type="checkbox"/> None or few in good condition
16. Are there picnic table(s) in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are they in good condition?	<input type="checkbox"/> All or most in good condition <input type="checkbox"/> About half <input type="checkbox"/> None or few in good condition
Is there a picnic shelter in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
Is there a grill or fire pit in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
17. Are there trash cans in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are they overflowing with trash?	<input type="checkbox"/> All or most overflowing <input type="checkbox"/> About half <input type="checkbox"/> None or few overflowing
Are they near activity areas?	<input type="checkbox"/> All or most are near <input type="checkbox"/> About half <input type="checkbox"/> None or few are near
Are recycling containers provided?	<input type="checkbox"/> No <input type="checkbox"/> Yes
18. Are there food/vending machines available in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are fruits and/or vegetables available in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
19. If the sun were directly overhead, how much of the park would be shaded ?	<input type="checkbox"/> <25% <input type="checkbox"/> 25-75% <input type="checkbox"/> >75%
20. Are there rules posted about animals in the park? (e.g. dogs must be leashed)	<input type="checkbox"/> No <input type="checkbox"/> Yes
21. Is there a place to get dog waste pick-up bags in the park?	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
Are bags available at any of the locations?	<input type="checkbox"/> No <input type="checkbox"/> Yes
22. Are there lights in the park? (not including neighborhood street lights)	<input type="checkbox"/> No <input type="checkbox"/> Yes
If yes ...	
How much of the park can be lit by these lights?	<input type="checkbox"/> <25% <input type="checkbox"/> 25-75% <input type="checkbox"/> >75%
Are the activity areas lit?	<input type="checkbox"/> All or most are lit <input type="checkbox"/> About half <input type="checkbox"/> None or few are lit
23. Is the park monitored ? (e.g., volunteer or paid staff, patrolled by police, cameras, etc.)	<input type="checkbox"/> Unsure <input type="checkbox"/> Yes
24. Are there any emergency devices in the park? (e.g., phone, button, emergency directions)	<input type="checkbox"/> No <input type="checkbox"/> Yes

25. From the center of the park, how visible is the surrounding neighborhood ?	<input type="checkbox"/> Fully	<input type="checkbox"/> Partially	<input type="checkbox"/> Not at all
26. Are there road(s) of any type through the park?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
If yes ...			
Are there traffic control mechanisms on the roads within the park? (e.g., crosswalk, stop light or sign, brick road, speed bumps, roundabouts)	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
27. Which of the following park quality or safety concerns are present in the playground ? <i>(Check all that are present.)</i>			
<input type="checkbox"/> Graffiti (e.g., markings or paintings that reduce the visual quality of the area)			
<input type="checkbox"/> Vandalism (e.g., damaged signs, buildings, equipment, etc.)			
<input type="checkbox"/> Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)			
<input type="checkbox"/> Excessive animal waste (e.g., noticeable amounts of dog waste)			
<input type="checkbox"/> Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)			
<input type="checkbox"/> Poor maintenance (e.g., overgrown grass/weeds/bushes or lack of grass in green areas)			
<input type="checkbox"/> Evidence of threatening persons or behaviors (e.g., gangs, alcohol/drug use)			
<input type="checkbox"/> Dangerous spots in the park (e.g., abandoned building, pit/hole)			
<input type="checkbox"/> Other _____			
<input type="checkbox"/> None present			
28. What aesthetic (i.e., beautiful/pleasing) features are present in the park ? <i>(Check all that are present.)</i>			
<input type="checkbox"/> Evidence of landscaping (e.g., flower beds, pruned bushes)			
<input type="checkbox"/> Artistic features (e.g., statue, sculpture, gazebo, fountain)			
<input type="checkbox"/> Historical or educational feature (e.g., monument, nature display, educational signs, etc.)			
<input type="checkbox"/> Wooded area (e.g., thick woods or dense trees)			
<input type="checkbox"/> Trees throughout the park (e.g., scattered trees)			
<input type="checkbox"/> Water feature (e.g., lake, stream, pond)			
<input type="checkbox"/> Meadow (e.g., natural, tall grassy area)			
<input type="checkbox"/> Other _____			
<input type="checkbox"/> None present			

Section 5: Playground Utilization

Playground	Summer	Mon		Tue		Wed		Thu		Fri		Sat		Sun	
		Kids	Parents	Kids	Parents	Kids	Parents	Kids	Parents	Kids	Parents	Kids	Parents	Kids	Parents
City Prk Playground	10:30-12:30														
	4:00-6:00														
	Total(Kids&Parents)														
	Total(Kids+Parents)														
CICO Park Playground	10:30-12:30														
	4:00-6:00														
	Total(Kids&Parents)														
	Total(Kids+Parents)														
Northview Playground	10:30-12:30														
	4:00-6:00														
	Total(Kids&Parents)														
	Total(Kids+Parents)														
	Total(Kids+Parents)														

Note and Reference

1. Before you are finished, please make sure you have answered all questions in the tool.

2. About this Community Playground Audit Tool (CPAT)

The Community Playground Audit Tool is adopted from the Community Park Audit Tool (CPAT) developed in 2010 in Kansas City, Missouri, by Andrew Kaczynski (Kansas State University) and Sonja Wilhelm Stanis (University of Missouri), in collaboration with the City of Kansas City Missouri Parks and Recreation Department.

B Playground Survey Form

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Playground Survey Form

Name of college/university:	School of Planning, Architecture and Design, Kansas State University
Name of graduate student :	Kanglin Yao

Note: You are invited to take this playground utilization survey for a playground utilization study described in the cover letter. Please provide the most accurate information to your knowledge regarding the following questions.

Section I Basic Participant Information

A. Basic participant information (1-3).

1. Which of the following best describes you?

Legal guardian Babysitter

2. What is your gender?

Male Female

3. What are the ages of your children?

0 to 5 6 to 10 11 to 15 over 16 years

4. By what means did you get to the playground for this visit?

Driving Biking Walking Others: _____

5. How far did you travel to get to this playground for this visit?

0 to 1/4 mile 1/4 to 1/2 mile 1/2 to 1 mile More than 1 miles More than 5 miles

6. How often do you and your child(children) visit this playground?

Daily Weekly Monthly Occasionally Rarely

7. Please tell us the street intersection closest to your residency if you are willing to share this information?

* Note: This information will be used for generating the shortest distance from the intersection to this playground on the map.

(_____) Dr./St. and (_____) Dr./St.

Section II City Park Playground Survey

Please rate the following items according to the scale:

B. These questions (8 to 12) are about the large play structures for ages 5+ in this playground.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the large play structure for older children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
8. Slides (straight and spiral slides)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
9. Climbing equipment (monkey bars, horizontal bars, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
10. Tornado spinner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
11. Pretend play equipment (space under the play structure)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
12. Play structure as a whole (dimensions, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

C. These questions (13 to 15) are about the smaller play structure for children under 5.

	How often does your child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the play structure for younger children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
13. Slides (straight and spiral slides)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
14. Pretend play equipment (spaces under the play structure)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
15. Play structure as a whole (size, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

D. These questions (16 to 18) are about the two swing areas.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment in swing area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
16. Belt swings for older children	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
17. Safe swings with safe locks	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
18. Full bucket swings for babies	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

E. These questions (19 to 21) are about the toddler area.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment in toddler area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
19. Balance beam	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
20. Spring rockers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
21. Sandbox with excavator	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

F. These questions (22 to 23) are about the water pad.

22. What are the things you DO NOT like about the water pad in City Park playground? <input type="checkbox"/> Freezing water <input type="checkbox"/> Hard concrete surface <input type="checkbox"/> Water spray is too aggressive <input type="checkbox"/> Lack of slow-paced water play equipment for toddlers (pond, river, etc.)											
	How often does your older child use the water pad when visiting this playground during the summer?					How satisfied are you with water pad?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
23. Water pad (splash park)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

G. These questions (24 to 25) are about the climbing area.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment in climbing area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
24. Flexible rope climber	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
25. Rock climber	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

H. These are general questions (26-32) about overall playground performance.

26. What is your overall satisfaction about the playground's access to nature?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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27. What are your favorite things about this playground in general? (Please check all that apply.)

<input type="checkbox"/> Unique design	<input type="checkbox"/> Challenging	<input type="checkbox"/> Age-appropriate spaces
<input type="checkbox"/> Size	<input type="checkbox"/> Natural looking/ wood	<input type="checkbox"/> Children have fun
<input type="checkbox"/> Creative play	<input type="checkbox"/> Variety of activities	<input type="checkbox"/> Enclosed/safety/secure
<input type="checkbox"/> Active play	<input type="checkbox"/> Benches/gathering space	<input type="checkbox"/> Appeals to wide age group
<input type="checkbox"/> Accessibility	<input type="checkbox"/> Rubberized surface	<input type="checkbox"/> Other: _____

28. What are the things you DO NOT LIKE about this playground? (Please check all that apply.)

<input type="checkbox"/> Lack of unique play equipment	<input type="checkbox"/> Slides	<input type="checkbox"/> Lack of shade	<input type="checkbox"/> Boring activities
<input type="checkbox"/> Surface/wood chips	<input type="checkbox"/> Lack of equipment	<input type="checkbox"/> No fencing	<input type="checkbox"/> Structure design
<input type="checkbox"/> Metal structure	<input type="checkbox"/> Lack of climb /challenge	<input type="checkbox"/> Lack of site amenities	<input type="checkbox"/> Safety concerns
<input type="checkbox"/> Lack of visibility	<input type="checkbox"/> Not age separated	<input type="checkbox"/> Lack of benches / tables	<input type="checkbox"/> Other: _____

29. What are your hopes, expectations, and ideas for the future of playgrounds? (Please check all that apply.)

<input type="checkbox"/> Diverse play equipment	<input type="checkbox"/> Mixed ages	<input type="checkbox"/> Modern / bright colors	<input type="checkbox"/> Site amenities
<input type="checkbox"/> Creative play equipment	<input type="checkbox"/> Better visibility	<input type="checkbox"/> Parent participation in play	<input type="checkbox"/> Landscaping / shade
<input type="checkbox"/> Challenging play equipment	<input type="checkbox"/> Community effort	<input type="checkbox"/> Safe	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Natural looking (wood)			

30. Why did you choose this particular playground for this visit? (Please check all that apply.)

<input type="checkbox"/> Play equipment attract my children the most	<input type="checkbox"/> No other places available for my children to go
<input type="checkbox"/> No playground near where we live	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Nearest playground is less interesting	

31. What is your overall opinion of this playground?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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32. What improvements could be implemented to increase your playground visits? (Please share any ideas for improvement of this playground.)

End of survey for City Park playground—thank you!


Section III CICO Park Playground Survey

Please rate the following items according to the scale:


B. These questions (8 to11) are about the large play structures for ages 5+ in this playground.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the large play structure for older children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
8. Slides (straight and spiral)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
9. Belt swings	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
10. Climbing equipment (monkey bars, horizontal bars, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
11. Play structure as a whole (dimensions, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

C. These questions (12 to 14) are about the new smaller play structure for children under 5.

	How often does your child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the play structure for younger children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
12. Slides (straight and spiral)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
13. Monkey bars, ladders	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
14. Play structure as a whole (size, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

D. These questions (15 to 17) are about the older smaller play structure.

	How often does your child use the play equipment when visiting this playground?					How satisfied are you with play equipment in the swing area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
15. Slide	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
16. Climbing equipment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
17. Play structure as a whole (size, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

E. These questions (18 to 22) are about the pretend play equipment.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment in the toddler area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
18. Canon	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
19. Wagon	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
20. Indian tent	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
21. Vending wagon	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
22. Bridge and cave beneath it	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

F. These questions (23 to 29) are about other equipment.

	How often does your child use the play equipment when visiting this playground?					How satisfied are you with play equipment in the toddler area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
23. Sandbox with excavator	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
24. Spring rockers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
25. Sound play equipment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
26. Swing area (belt and bucket swings)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
27. Merry-go-round	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
28. Climbing cage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
29. Spring rocker	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

G. These are general questions (30-36) about overall playground performance.

30. What is your overall satisfaction about this playground's access to nature?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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31. What are your favorite things about this playground in general? (Please check all that apply.)

<input type="checkbox"/> Unique design	<input type="checkbox"/> Challenging	<input type="checkbox"/> Age-appropriate spaces
<input type="checkbox"/> Size	<input type="checkbox"/> Natural looking/ wood	<input type="checkbox"/> Children have fun
<input type="checkbox"/> Creative play	<input type="checkbox"/> Variety of activities	<input type="checkbox"/> Enclosed/safety/secure
<input type="checkbox"/> Active play	<input type="checkbox"/> Benches/gathering space	<input type="checkbox"/> Appeals to wide age group
<input type="checkbox"/> Accessibility	<input type="checkbox"/> Rubberized surface	<input type="checkbox"/> Other: _____

32. What are the things you DO NOT LIKE about this playground? (Please check all that apply.)

<input type="checkbox"/> Lack of unique play equipment	<input type="checkbox"/> Slides	<input type="checkbox"/> Lack of shade	<input type="checkbox"/> Boring activities
<input type="checkbox"/> Surface/wood chips	<input type="checkbox"/> Lack of equipment	<input type="checkbox"/> No fencing	<input type="checkbox"/> Structure design
<input type="checkbox"/> Metal structure	<input type="checkbox"/> Lack of climb / challenge	<input type="checkbox"/> Lack of site amenities	<input type="checkbox"/> Safety concerns
<input type="checkbox"/> Lack of visibility	<input type="checkbox"/> Not age separated	<input type="checkbox"/> Lack of benches / tables	<input type="checkbox"/> Other: _____

33. What are your hopes, expectations, and ideas for the future of this playground? (Please check all that apply.)

<input type="checkbox"/> Diverse play equipment	<input type="checkbox"/> Mixed ages	<input type="checkbox"/> Modern / bright colors	<input type="checkbox"/> Site amenities
<input type="checkbox"/> Creative play equipment	<input type="checkbox"/> Better visibility	<input type="checkbox"/> Parent participation in play	<input type="checkbox"/> Landscaping / shade
<input type="checkbox"/> Challenging play equipment	<input type="checkbox"/> Community effort	<input type="checkbox"/> Safe	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Natural looking (wood)			

34. Why did you choose this particular playground for this visit? (Please check all that apply.)

<input type="checkbox"/> Play equipment in this playground attract my children the most	<input type="checkbox"/> No other places available for my children to go
<input type="checkbox"/> No playground near where we live	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Nearest playground is less interesting	

35. What is your overall opinion about this playground?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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36. What improvements could be implemented to increase your playground visits? (Please share any ideas for improvement of this playground.)

End of survey for CICO Park playground—thank you!

Section IV Northview Playground Survey

Please rate the following items according to the scale:

These questions (8 to 12) are about the play structures for ages 5+ in this playground.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the large play structure for older children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
8. Slides (straight and spiral)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
9. Climbing equipment (monkey bars, horizontal bars, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
10. Tornado spinners	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
11. Pretend play equipment (space under the play structure)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
12. Play structure as a whole (dimensions, design, and material)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

B. These questions (13 to 14) are about the yellow climbing structure and a spinner, AKA sky runner.

	How often does your child use the play equipment when visiting this playground?					How satisfied are you with play equipment of the play structure for younger children?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
13. Climbing structure (yellow)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
14. Playground spinner (sky runner)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

C. These questions (15 to 16) are about the swing area.

	How often does your older child use the play equipment when visiting this playground?					How satisfied are you with play equipment in swing area?					
	Never	Rarely	Sometimes	Very often	Always	Very unsatisfied	Unsatisfied	Somewhat satisfied	Satisfied	Very satisfied	N/A
15. Belt swings for older children	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>
16. Safe swings with safe locks	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<input type="checkbox"/>

D. These are general questions (17-23) about overall playground performance.

17. What is your overall satisfaction about this playground's access to nature?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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18. What are your favorite things about this playground in general? (Please check all that apply.)

<input type="checkbox"/> Unique design	<input type="checkbox"/> Challenging	<input type="checkbox"/> Age-appropriate spaces
<input type="checkbox"/> Size	<input type="checkbox"/> Natural looking/ wood	<input type="checkbox"/> Children have fun
<input type="checkbox"/> Creative play	<input type="checkbox"/> Variety of activities	<input type="checkbox"/> Enclosed/safety/secure
<input type="checkbox"/> Active play	<input type="checkbox"/> Benches/gathering space	<input type="checkbox"/> Appeals to wide age group
<input type="checkbox"/> Accessibility	<input type="checkbox"/> Rubberized surface	<input type="checkbox"/> Other: _____

19. What are the things you DO NOT LIKE about this playground? (Please check all that apply.)

<input type="checkbox"/> Lack of unique play equipment	<input type="checkbox"/> Slides	<input type="checkbox"/> No fencing	<input type="checkbox"/> Boring activities
<input type="checkbox"/> Surface/wood chips	<input type="checkbox"/> Lack of equipment	<input type="checkbox"/> Lack of shade	<input type="checkbox"/> Safety concerns
<input type="checkbox"/> Metal structure	<input type="checkbox"/> Lack of climb / challenge	<input type="checkbox"/> Lack of site amenities	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Lack of visibility	<input type="checkbox"/> Not age separated	<input type="checkbox"/> Lack of benches / tables	
<input type="checkbox"/> Structure design			

20. What are your hopes, expectations, and ideas for the future of this playground? (Please check all that apply.)

<input type="checkbox"/> Diverse play equipment	<input type="checkbox"/> Mixed ages	<input type="checkbox"/> Modern / bright colors	<input type="checkbox"/> Site amenities
<input type="checkbox"/> Creative play equipment	<input type="checkbox"/> Better visibility	<input type="checkbox"/> Parent participation in play	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Challenging play equipment	<input type="checkbox"/> Community effort	<input type="checkbox"/> Safe	
<input type="checkbox"/> Natural looking (wood)	<input type="checkbox"/> Landscaping / shade		

21. Why did you choose this particular playground for this visit? (Please check all that apply.)

<input type="checkbox"/> Play equipment in this playground attract my children the most	<input type="checkbox"/> No other places available for my children to go
<input type="checkbox"/> No playground near where we live	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Nearest playground is less interesting	

22. What is your overall opinion about this playground?

<input type="checkbox"/> 1 Very unsatisfied	<input type="checkbox"/> 2 Unsatisfied	<input type="checkbox"/> 3 Somewhat satisfied	<input type="checkbox"/> 4 Satisfied	<input type="checkbox"/> 5 Very satisfied	<input type="checkbox"/> N/A
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23. What improvements could be implemented to increase you playground visits? (Please share any ideas for improvement of this playground.)

End of survey for Northview Elementary School playground—thank you!

C IRB Approval Form



TO: Hyung Jin Kim
 Landscape Architecture/Regional & Community Planning
 Seaton Hall

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

DATE: 11/7/2014

RE: Proposal #6982.2, entitled "An Observational Study on the Association between Playground Features and Children's Playground Utilization."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #6982,
 ENTITLED, "An Observational Study on the Association between Playground Features and Children's
 Playground Utilization"

Addition of a question to the survey, recorded questions.

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.