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Addressing Obsolescence in Fort Worth Public pools: Enhancing Forest Park Public City Pool

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ADDRESSING OBSOLESCENCE IN FORT WORTH PUBLIC POOLS:

ENHANCING FOREST PARK PUBLIC CITY POOL

by

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Abstract

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The city of Fort Worth, Texas has strived to ensure high-quality recreational water activities, which resulted in the closure or demolitions of several demolished aquatic parks in 2009. With many parks exceeding their lifespan, depicting functional and physical obsoleteness, and presenting health and safety risk to swimmers; the city, following the audit report, demolished famous aquatic parks, such as: Sycamore Pool, Hillside Park Lake, Como Park, Sylvania Park, Marine Creek Park, and Kellis Park, etc. In July 2008, Counsilman-Hunsaker conducted a city-wide Aquatic Master Plan to determine the future of the city's aquatic parks (Counsilman-Hunsaker, Inc.,2012). Implementation strategies included replacing the city's aging and obsolete pools. All these parks have lasted for more than 50 years, while the lifespan of Class B pools should have been 30-35 years. Although the demolition targeted parks above 40 years, Forest Park survived the 2009 demolition but suffered a reduction in government funding, which crippled the aquatic park, inhibiting it from guaranteeing quality, health, and safety of swimmers and other visitors. The pool's aesthetic appearance degraded tremendously, while the machines, equipment, and different element stopped functioning. This resulted in the temporary closure of the park only one year after the demolition of six aquatic parks in the region. This design master thesis aimed at investigating obsoleteness and unsafe public pools in Fort Worth, Texas, and proposed park

improvements to inform park planners and landscape architects. It also proposed the implementation of a design to enhance Forest Park's aging community public pool. The study focused on the qualitative research method in which the research and data are majority non-numerical, capturing concepts and suggestions from the literature review, primary, and secondary (Marcus, C. C., & Francis, C. (1998) It culminated the primary data collection on the local site, examined case studies, while the secondary data collection was attained from precedent studies and literature review. , the study found that Forest Park depicted physical and functional obsoleteness, and many elements were not working properly. It remained unattractive due to insufficient maintenance and repair. All these problems were contributed by the lack of funds to facilitate the advancement of the facility. In conclusion, this research not only examines the conditions impacting Fort Worth public pools but also introduces design vision for Forest Park. It is recommended that the city seek partnership with the private stakeholders to raise funds for renovations, cooperate, and engage the community. Finally, expatiate pool construction to enable the park to accommodate the increasing demand for pools in the city.

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Chapter 1

Introduction

1.1 Background

In the city of Fort Worth, Texas (TX), there is a shortage of public recreational swimming pools. According to Aquatics Master Plan (AMP) (2008), only two public community pools serve the entire city, which are Marine Creek in the north and Forest Park pool in the south. This study aimed to design a public city recreational pool for the aging 100-year-old Forest Park, which serves the large community of south Fort Worth. This chapter introduces the problem statement, the research questions, the purpose of the study, research methods, definitions of key terms, methodology and significance, and limitations. Considering the enormous population within the city, it is safe to conclude that the aquatic recreational facilities are significantly strained. Budgetary constraints have been the main obstacle towards the construction of sufficient public pools in Fort Worth (Connely, 2018). Richard Zavala, the City Parks' Director, confessed (Zavala, R (2014) that public swimming pools are an extremely expensive investment. Zavala's statement confirmed why the city has continued to fund other social amenities such as: community centers, golf courses, and trails. According to Zavala (2014), the expenses incurred in constructing a new swimming pool are enough to build ten baseball fields.

1.2 Problem Statement

On January 15, 2008, Fort Worth's City Council embraced the city-wide Aquatic Master Plan (AMP, 2013). It was estimated that its implementation would cost $66.3 million between 2008 and 2022. (AMP,2013) proposed six spray grounds, nine average-sized family community aquatic amenities, and the demolition of five obsolete community swimming pools. However, budgetary cuts in the 2009 financial year saw the closure of six swimming pools. In July 2010, authorities shut down the Forest Park swimming pool due to its structural limitations, leaving the city without any operational swimming pool. The available swimming pools are not only insufficient but pose safety risks to users. If one were to rank significant cities in Texas based on public pool availability, Fort Worth would be one of the last on the list.

1.3 Purpose of the Study

The purpose of this Design thesis is to incorporate a new public pool design for the Forest Park in Fort Worth TX, what amenity pool criteria will this master design thesis produce?

This master design thesis will inform landscape architects, aquatic professionals, and park planners. Also, the study intends to suggest and recommend a new public pool design to enhance the city's aging, community public pool parks.

The availability of only two public pools serves a population of over 870,000 residents (about half the population of Idaho) in Fort Worth, TX asserting that existing public pools in Fort Worth, TX were constructed many years back. Their depreciation augments the risk of injuries while swimming. It is necessary to build well-designed public pools suitable for both the young and elderly populations that will lessen the harm and drowning cases.

1.4 Research Questions

This research poses two critical research questions:

1. What aquatic design approach, trend, and programming is considered for the new Forest Park public pool design?
2. What additional benefits will Landscape Architecture bring to the Forest Park public pool design?

1.5 Definitions of Key Terms

Pool. Any human-made permanently installed or non-portable structure, basin, chamber, or tank containing an artificial body of water that is used for swimming, diving, aquatic sports, or other marine activity other than a residential pool; that is operated by an owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for use. The pool may be either publicly or privately owned. The term does not include a spa or a decorative fountain that is not used as a pool. References within the standard-to-various types of pools are defined by the following categories (Texas Department of State Health Services [TDH (Texas Department of Health) 2004)]):

Leisure Pool. A pool that is 0-4 feet deep. The shallow depth of the leisure pools provides children and adults with aquatic interaction, relaxation, entertainment, and fun. The pools come in different sizes and designs and are attractive for everyone. Leisure pools also have an allowance for additional amenities, that make the whole swimming experience memorable. Free-form pools that include fun attractions, such as, waterslides and play features.(Aquatics Facility study,2012)

Class B Pool. Any pool that is open to the public, which can be used for recreational purposes with or without a fee. (TDH 2004)

Class D Pool. A wading pool that is usually not more than 24 inches deep. (TDH 2004)

Beach Entry. A pool designed with one or two gradual sides, to facilitate an easy transition from the land to water. Instead of climbing or jumping into the pool, patrons would just walk inside as one would do at a beach.

Lazy River. A current river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to leisurely enjoy the water.

Class C Pool. Any pool that is operated for and in conjunction with:

i. Motels, apartments, mobile home parks, and lodgings, such as hotel condominiums.

ii. Property owner associations, clubs, or private organizations but not free for use by the public.

Play Features. Interactive play features bring recreational value to aquatic facilities. Children can slide down just-their-size waterslides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. Valves, chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features, they control where and when the water sprays will occur.

Class A Pool. Any pool used, with or without a fee, for accredited competitive aquatic events, such as: Federation International De Natation Amateur (FINA), United States Swimming, United States Diving, National Collegiate Athletic Association (NCAA), and National Federation of State High School Associations (NFSHSA) events. (TDH 2004)

Waterslides. Waterslides provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water.

Shade Features. Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. It covers, connects, and join areas while providing relaxation out of the sun.

Splash Pads. Water spray features enhance the recreation value of a park or aquatic facility by featuring splash pads located on a concrete splash pad, either with or without standing water. Because of minimal water depth, splash pads can, in most jurisdictions, be operated without certified lifeguards, making them a cost-effective addition for all types of parks, recreation areas, and aquatic canters.

Community Family Public Swimming Pool. Community family public swimming pools offer family amenities in a cosy atmosphere, thus delivering a friendly customer experience in a local community. It typically includes a leisure pool, lap lanes, tot pool, play feature, and shade areas.

Aquatic Design. Detailed drawings of pool shells, pool structures, pool filtration systems, and other equipment for new or soon-to-be renovated swimming facilities.

Bathhouse. A building with restrooms, showers, family changing rooms, locker rooms, concessions, supplies, and equipment.

National Recreation and Parks Association (NRPA). NRPA supports the significance of making parks, open space, and recreational opportunities available to all Americans.

National Sporting Goods Association (NSGA). NSGA supports retailers, dealers, wholesalers, manufacturers, and sales agents with survey data in the sporting goods industry.

Decks. Areas immediately adjacent to or attached to a pool or spa that are specially constructed or installed for sitting, standing, or walking.

Handrail. A railing that is intended to be gripped for resting and/or steadying a person while entering or exiting a pool or spa, and that is typically part of a ladder, a set of steps, or deck-installed equipment.

Ladders. A series of vertically separated treads or rungs connected by vertical rail members or independently fastened to an adjacent vertical pool or spa wall.

(a) Deck Ladder - A ladder ascending from ground level outside the pool, or spa, to the level of a deck.

(b) In-Pool or In-Spa Ladder - A ladder located in a pool or spa to provide ingress and egress from the deck.

Slip-Resistant. A surface that has been treated or constructed to reduce the chance of slipping significantly.

Steps, Recessed Steps, Ladders, and Recessed Treads. A means of pool and spa ingress and egress that may be used separately or together.

Steps. A riser/tread or series of risers/treads are extending down from the deck and terminating at the pool or spa floor. Included are recessed steps that have the risers located outside of user areas.

Underwater Light. A fixture designed to illuminate a pool or spa from beneath the water surface.

1.6 Methodology

This section conveys the study's strategy and discusses the analysis methods and data sources used in this thesis. A combination of quantitative and qualitative techniques from and Marcus and Francis (1998) Marcus, C. C., & Francis, C. P.166(1998) and (City-Wide Aquatic facilities master plan Update 2012) quantitative process. These case studies include location and context, Description, Major Uses and Users and successful and unsuccessful features. These observations will document existing public pools in Fort Worth, TX and extended locations. Four case studies were included in the study. Two were community public swimming pools in the Dallas-Fort Worth area of TX. These two were conducted on-site and was implemented to understand the characteristics of a recreational public community pool. The other two were located outside. In the culmination of the literature review and case studies, the information gathered were used to suggest recommendations and propose program elements for the community's public pool design for Forest Park.

Furthermore, to create an empirical set of data from a collection of diverse qualitative research, every stage of the methodology shows consideration to the design principles of recreational community public pool amenities Class B pool for the city of Fort Worth, Texas.

1.7 Significance and Limitations

This research intends to analyze and evaluate obsolete and aging Fort Worth public pool parks and issue proposals on future city pool developments. Findings and recommendations from this study

intents to inform landscape architects, aquatic professionals, and park planners on public pool design. This study only focused on the obsolete Class B pools public city pools in Fort Worth, Texas separating and overlooking all other pools, including the semipublic pools. The data collected in this research is primarily from secondary and archival sources.

1.8 Summary

This chapter provided a general overview of the main study components of a community public pool. Including the problem statement, the purpose of the study, and the main research questions which guided this study. Also, the chapter defined key terms relevant to the study, highlighting both its methodology and limitations for this study. The consequent chapters will cover literature review, methods, analysis and findings, design and conclusion, and further analyze and help recommend the design for the community public pool in Forest Park city of Fort Worth, Texas.

Chapter 2

Literature Review

2.1 History of Public Pool Trends

Originally, the country's public swimming pools functioned as big bathtubs, used by the poor and immigrants. Over time, the municipal pools have evolved to become recreational destinations and a place where families from all social classes converge to have fun. Jeff Wiltse, in his 2007 book titled, *Contested Waters: A Social History of Swimming Pools in America,* provides an interesting account of the evolution of municipal swimming pools in America (Wiltse, 2007). In the late 19th century, before Louis Pasteur's Germ Theory of Disease became widely accepted, public pools built in different municipalities acted as austere bathing spots.

Figure 2-1 Fort Worth Parks (*Allen Kline, S. (2010).*)

The pools accommodated both the whites and African Americans, and no one minded the racial differences. With an average of 144,000 swimmers every day, the pools became very popular (NPR.org, 2007). Things, however, changed in the first half of the twentieth century, when swimmers started being segregated in the public swimming pools, based on their racial backgrounds. Wiltse (2007) attributed these new developments to the institutional, cultural, and social transformations that start of the twentieth century. This period, according to Wiltse (2007), was particularly marked by urbanization, progressive

reforms, the wearing down of the Victorian culture, and the rise of racial segregation in public places among other notable developments. The history of public swimming pools, therefore, mirrors the contested transition of America to contemporary society (NPR.org, 2007).

The second wave of social transformations that occurred in the next half of the twentieth century changed the status quo of the municipal swimming pools. Black Americans objected to the segregation by continuously pursuing entrance to pools that were only designated for the whites. Also, the Blacks filed several litigations against their city's authorities.

Figure 2-2 Fort Worth Parks (*Allen Kline, S. (2010).*)

Eventually, these legal and social protests led to the desegregation of municipal swimming pools. Although desegregation had been outlawed, the Blacks and the Whites rarely swam together. As the African Americans were granted access to public pools, the Whites abandoned them. The desegregation of public swimming areas was the main factor behind the rise of private swimming pools in the second half of the twentieth century. By the 1980s, most White middle-class Americans used their backyard pools or the suburban club swimming pools (NPR.org, 2007). This contrasted with the African Americans and the Latinos who swam their respective municipal pools.

Throughout history, public pools have acted as platforms for social clashes. Hidden social conflicts often exploded into fights at the pools, since the pools were spaces where the community converged and shared a prolonged and intimate contact. People who could not have a close engagement

in the streets now had an opportunity to share the same waters. Over time, municipal swimming pools became highly disputed public spaces due to the physical and the visual intimacy that came with swimming. The cause of disagreement revolved around the appropriate locations to construct the pools, the people allowed to use them, and how they were supposed to be used. This prompted the creation of pool rules and the emergence of different pool designs. The history of public swimming pools in the U.S. mirrors the longstanding tension of social discrimination (NPR.org, 2007).

2.2 Approach to Public Pool Planning

In Texas, no one can start constructing a new swimming public pool without first seeking approval of plans and specifications from the city's plans official. Pool safety is vital when designing or drawing a construction plan for a swimming pool. According to the Health and Safety Code of Texas, Sec. 341.0645 on pool safety, the swimming pool contractor must adhere to the set safety standards. The safety standards are necessary in providing conditions that would prevent drowning cases (Healthy & Safety Code, n.d). One of the measures to prevent drowning and near-drowning includes things such as fencing around public pools. The barrier fences should meet specific requirements such as being at least 8 feet high and having neither hands nor footholds that could allow vulnerable people like children to climb them (World Health Organization [WHO], 2016).

City-wide aquatic facilities have been designed to meet the demands presented by various segments of aquatic users. Users are classified under four main categories, with each having different aquatic design preferences and needs. Particularly, while some need aquatic recreation facilities, others need them for lessons. Swimming pools are also used by athletes, while others use them for therapy. According to the National Sporting Goods Association's statistics, the recreational group constitutes more than 90 percent of all public city pool users (Kimley-Horn & Associates, Inc., 2012). The critical percentage of recreational pool users encompasses individuals from different age groups, ranging from children to adults. Statistics show that most recreational swimming activities happen during the summer period, supporting the need for open-air aquatics. Communities situated in regions with short summers and cold winters also desire open-air swimming amenities to be used in summer.

Recreational aquatic users have a heightened preference towards warmer and shallower waters, to facilitate socialization and extended stays. A study conducted by Counsilman-Hunsaker revealed that

recreational aquatic use accounts for 75 percent of the total revenues derived from aquatics (Kimley-Horn & Associates, Inc., 2012). Present-day recreational aquatic amenities integrate fun features, such as children's playground equipment, to facilitate interactions and play.

Figure 2-3 Randol Mill Public Pool, Arlington, TX (Google photos)

The new facilities also have waterslides that suit various age groups from children to adults. Pools with varying depths, including the zero-depth beach entries and plunge pools, are also a common phenomenon in the current recreation aquatics realm. Although aquatic facilities provide swimming lessons, only 20 percent of the revenues are generated from aquatics, while competition users normally account for three percent of the income (Kimley-Horn & Associates, Inc., 2012). Therapy aquatic usage has been on the rise over the past few years. Research confirms that aquatic exercise increased by 25 percent between 2004 and 2007 (Kimley-Horn & Associates, Inc., 2012). Individuals using the aquatic facilities for therapy often require small-sized pools with warm water, which can also provide a variety of programs and classes. This group typically generates approximately two percent of the aquatic's net revenue (Kimley-Horn & Associates, Inc., 2012).

Until the 1960s, many public pools in the neighborhoods were filled every day with clean water and emptied (Kimley-Horn & Associates, Inc., 2012). Anxieties over the outbreak of infectious diseases contributed to the formulation and implementation of stricter sanitation codes. As the rules became tougher and liability fears augmented, many municipal pools started doing away with features like small

water slides and diving boards. This phenomenon was also occasioned by the advent of increased depth and approval requirements. Increased operating expenses and ever-rising competition for leisure time resulted in low pool turn out the closure of several swimming pools throughout the country. Starting in the late 1970s and early 1980s, the *water park* model became common, with more fascinating water typologies such as lazy rivers and wave pools (Kimley-Horn & Associates, Inc., 2012).

Innovative operators started incorporating some of these characteristics into the public aquatic amenities. Some even built public water parks to attract aquatic users again and generate higher revenues with more admissions to counterbalance the operational costs. Garland city premiered the wave pool construction in 1983. North Richland Hills opened its first waterpark: NRH20 in 1995, while Hurst, Texas opened two newly designed "family aquatic centers" in 1996 and 1997 (Kimley-Horn & Associates, Inc., 2012). Family aquatic centers are an amalgamation of the old traditional pool designs and waterpark components such as: current channels, lazy rivers, and water slides among others.

Figure 2-4 NRH20 Public City Pool, Richland Hills, TX (Google photos)

Since the construction of the initial family aquatic centers, Texas has been ranked among the prominent states in building family aquatic centers, replacing the old rectangular public pools. Over the past 25-30 years, several municipalities in Texas have demonstrated by the incorporation of entertaining features into the aquatic recreational facilities results in far-reaching benefits (Kimley-Horn & Associates,

Inc., 2012). Particularly, cities have been able to meet the demands of recreational pool users, leading to high attendance rates. Also, the improved features allow authorities to set higher prices and generate additional revenues to withstand the high operational costs. The most noticeable trends in today's municipal aquatic designs include the construction of more extensive facilities, with added features to make the swimming experience entertaining (Kimley-Horn & Associates, Inc., 2012).

2.3 Classification and Local Codes

Public pools are classified as Class A, B, C, D, E, and F. Class A comprises any pool meant for use by credible competitive aquatic events. The use of Class A pools, however, is not only limited to competitive events but also for recreational purposes. Class B public pools are intended for public recreation. Class C is any pool that is meant for use by apartments, property owner associations, condominiums, and multi-family owned. Examples of type C pools are privately run pools in hotels, restaurants, lodgings, and motels. Class C pools are referred to as semi-public swimming pools. Type D, or other pools, is any pool run for specific reasons; that includes wave action pools, activity pools, vortex pools, sand-bottom pools, and lazy rivers. Type E, or therapy pool, is any pool utilized for physical therapy and is operated at a temperature of more than 86-degree F. Class F is any pool used for wading reasons; also known as the wading or kiddie pools (TDH 2004).

Table 2-1 Pool Occupancy Loads*(TDH 2004)*

Class B Pool-Pool Occupancy Load		
Class B pool - Any pool used for public recreation and open to the general public with or without a fee	Shallow/Instructional or Beginning or Wading Areas	15 sq. ft. water surface area per user

TDH,2004

The Texas code §2001.039 has set rules that outline the basic requirements for the construction, sanitation, operation of public pools, and spas. The regulations are in line with the good public health engineering practices that foster the health and safety of pool users (TDH 2004). The code further aims at preventing the occurrence of accidents, injury, and drowning incidences.

According to the Texas Department of Health (TDH) Standards for swimming pools and spas, the design and plan of all the classes of pools should be done by a licensed engineer (TDH, 2004). Under the health and safety of pools and spas code of Texas, the construction of the pools should utilize non-toxic materials for humans and the environment, the materials should also be durable and able to last longer. The construction materials should also withstand design and environmental stresses. Also, during construction, the engineer should put up a structure that is watertight with smooth and easy to clean surfaces. According to the Texas Administrative Code, Title 25, Part I, the swimming pools should adhere to the set sanitation regulations. The water poured into the pools should be free of contaminants like chemical or biological hazards (TDH, 2004).

The state of Texas has a diverse classification of pools from Classes A, B, C, D, E, and F. All these pools serve different purposes in facilitating recreational water activities. For example, Class A pool encompasses aquatic parks for accredited competitive events with or without a fee like the Federation International D National Amateur (AMP, 2013). The Class A pool enables both national and local governments to organize competitions without restraints. Class B pools are public pools used to accommodate the recreational activities of the public. It allows the public to relax, swim, and have fun with or without being charged a fee. Additionally, Class C pools are aquatic areas that operate for lodgings like motels, hotels, condominiums, or apartments. These pools are often owned and controlled by private property owners such as: private clubs, schools, colleges, and universities. Their access is often limited to the subscribed member and not to the public. Finally, Class D pools involve the wading pool with a maximum water depth of 24 inches at every point (Center for Disease Control [CDC], 2019). Regardless of nature or accessibility to the classified pool, each collectively work towards promoting recreational activities, whether professionally or just for fun.

However, all these pools must adhere to specific standards and regulations to ensure the safety and security of the swimmers and other guests. For instance, all Class A, B, C, and D pools aims at ensuring standardized quality and quantity of water to warrant safe swimming. Aquatic parks accurately manage the water quantity and quality of the diverse types of pools; not only to reduce the risks that may be related to drowning or chemical reactions, but also to facilitate maximum enjoyment among swimmers. With limited restrictions on who can access public pools, utmost care is paramount in such public

recreational water (Yuan et al., 2009). Additionally, ensuring high quality in recreational water help in preventing different water-related illnesses and pathogens such as: rashes, diarrheal diseases, ear infections, chemical irritation of the lungs and eyes, and respiratory infection that are common in the public pools (Sanborn & Takaro, 2013).

Since public pools can be easily contaminated by swimmers, animals, dead wildlife, and debris from dust, leaves, and grass, it creates a platform for responding to the contamination before they cause hazardous impacts (Barbot & Moulin, 2008). Maintaining pool quality involves critical elements like filtration, which involves pumping the pool or recreational water over filters to eliminate the particles and debris that make the pool dirty (Barbot & Moulin, 2008). It allows pool managers to eradicate contamination caused by leaves or dust particles. Moreover, chlorination, which involves using chlorine to disinfect the public recreational pools to further kills the germs after thorough filtration (Spiliotopoulou et al., 2015).

Additionally, using the pH level to depict the alkalinity and acidity of the pool enables the manager to note whether the pool is neutral, alkaline, or acidic (Hansen et al., 2012). This helps in setting the pool into the right as a safe condition to avoid infecting swimmers with diseases. Consequently, ensuring high quality in recreational water involves ensuring total alkalinity of the pools, especially in the concrete and painted swimming pools. Since many swimmers like clean, well-maintained, and magnificently presentable pools, ensuring total alkalinity of pools without disrupting the pH level helps in reducing chances of corrosion and deterioration of the pools over time (Spiliotopoulou et al., 2015).

Irrespective of the national pool regulation codes, many states in America have also developed unique legislations that enable them to propagate the safety of swimmers in aquatic park pools within the state (Blake & Peters, 2012). While many state laws only reaffirm the declaration of national codes, some states have either deviated or introduced new phenomena in the state laws to eliminate, not only health and safety threats, but also to ensure equal enjoyment among swimmers within various levels of recreational water facilities.

In the state of Alabama, before construction, remodelling, or alteration of the public pools, specification and approval may be obtained from the Baldwin County Health Department charged with the authority under section 22-2-2(4) and section 22-3-2(4); to promulgate and govern the construction,

equipment, and operations of the Alabama swimming pools (Baldwin County Board of Health, 2009). This code is vital in ensuring the utmost standard and high-quality equipment are utilized when constructing public pools in any city. In conjunction with the national codes and regulation, the states' law sanctions designers and constructors to prioritize safety rather than profitability (Liguori et al., 2014).

The materials must also exclude structural joints. For example, the Alabama state codes prohibit the use of vinyl liners to do the finishing of the pools. Although the codes do not limit the shape or size of the swimming pools, it prohibits construction of aquatic park walls that exceed 11 degrees for two feet nine inches for deep waters and two feet three inches for shallow waters. It also regulates the deck and deck equipment, circulation system disinfectants, electrical requirements, and safety equipment (Hendrix et al., 2010).

Furthermore, the Texas Department of State Health Services Pool and Spa Rules under section 265.190(e) ascertains that it has the authority to revise the plans and permits issued on the post 10/01/99 to ensure their compliance with the policy enforcement issues (Quan et al., 2020). The department confirms that only registered engineers and designers should be consulted in the construction of the pools and public spas before they are designated for construction. Like the federal and national codes, the Texas codes emphasize the vitality of regulating the actions of designers by subjecting them to conduct consultation with certified personnel. It also requires pool owners to attain written instructions from the builders containing information such as: procedures for filtration, backwash, cleaning, operation of all chemical feed devices, and general maintenance of pool or spa.

Moreover, the pool equipment like the pumps, filters, skimmers, chemical feeders, and other equipment, which falls within the scope of ANSI and NSFI Standard 50 - 1996 (ANSI/NSFI 50 - 1996), shall adhere to the standard as confirmed by a testing laboratory, except as otherwise noted in §265.190(h) of this title (relating to Suction Outlets and Return Inlets at Post-10/01/99 and Pre-10/01/99 Pools and Spas) (Hendrix et al., 2010). Consequently, the department prohibits the use of sand, but can only be used on impervious surfaces and controls to avoid adverse effects on maintenance, filtration, safety, and treatment system. Therefore, the states' laws and pool regulation codes adhere to the declaration of the national and federal legislations.

2.4 Relevance of Landscape Architecture to Public pools

2.4.1 Landscape Architecture

Landscape architects play a critical role in helping the client in selecting quality products, materials, and finishes, which not only makes a pool beautiful, but also durable. Depending on the client's decisions, landscape architects strive to solve the complex inground pool problems before construction of the pool. The designers and constructors of aquatic park pools must ensure the utilization of quality products and resources to guarantee swimmers' safety and health. For example, Fort Worth, Texas only has two operational public pools in the city despite previously possessing numerous public pools. As of 2010, many pools that did not meet either the national regulation or state legislations and many pools were shut down to prevent health risks and injuries among swimmers. This could be prevented by involving the landscape architects in the planning process to select long-lasting materials and designs that make the pool durable.

Landscape architecture focuses on the arrangement of land, water, plant forms, and structures for the best and greater enjoyment. Landscape architecture deals with challenges in land planning, which includes building sites, outdoor-living areas, parks, playgrounds, swimming pools, and gardens (Hansen, n.d). Landscape design also applies the knowledge of design and construction, which is also useful in engineering, architecture, and other branches of sciences and arts. Landscape architects employ a design process that scientifically involves all aspects of the land, the environment, and the growing plants. The inclusion of these aspects aims at meeting the needs of the user and ensures the establishment has an appealing, functional, and environmentally friendly design.

2.4.2 Landscape Architecture and Public Pools

Landscape architecture involves designs around the pool both in water and in the surrounding environment. It considers unique features meant to guarantee the safety, health, and enjoyment of customers during a session in the aquatic centers. For instance, pool landscaping includes the installation of features such as pool fencing, lighting, decking, paving, and furniture. It also encompasses creating a coordinated background to ensure captivating aesthetics, safety, lifestyle, and functionality.

For example, the modern Marine Park and Aquatic center in Fort Worth offers an exclusive landscape since the management has invested in the beatification of the infrastructure and the outlook of

the park. Unlike the former and original marine park, the modern aquatic center has a designed outlook that meets the contemporary socio-economic advancement and aquatic phenomena. The landscape designs make many parks in Fort Worth more attractive, not only in positioning, but also in the lighting, that makes the pools look classy during the day and late in the evening. Therefore, landscape architecture enables aquatic backs to increase the beauty and enhance customer attraction to Fort Worth pools like the modern and newly restored Marine Park and Aquatic Center.

As affirmed by the Consumer Product Safety Act, congress enforces viable regulations and implement legislation that protects the public against the risk of health and injuries that are associated with the respective consumer's products (Quan et al., 2020). Further, it accounts for the use of beautiful but non-slippery tiles (for example, in beach entry public pools) on the floor to prevent visitors from slipping and injuring themselves.

Moreover, landscape architecture prompts a relevance in enhancing the value of the aquatic parks in Fort Worth, TX. The uniquely designed aquatic park often has a high value in the market. With the increased competition in Fort Worth recreational water industry, many parks are investing in creative landscape designs to attract customers and increase the value of the facility for investors. Attracting financially stable investors is critical for pools like *Sycamore public pool* that do not charge the public for their services, but this forces the city to consider significant landscape architecture that entices investors to provide financial supports to facilitate such parks. The differentiation that landscaping architecture creates is to propel the market price of an aquatic facility.

Landscape architecture is the designing of outdoor areas, structures, and landmarks to attain social-behavioural, environmental, and aesthetic results. It encompasses the utilization of systems engineering techniques to construct various structures for human utilization. The activities of landscape architecture range from beautification of pack ways, public parks, aquatic parks to civil infrastructure to ensure the epitome of beauty that provides a soothing sensation or meets individuals' preferences. Good landscaping not only makes a park safer but also increases the beauty and increased the functionality of the place or space.

The functionality of the pool increases with the incorporation of unique landscaping as the designers use different methods to enhance the surrounding such as easing access to a specific place.

To develop an appealing and outstanding structure, designers should incorporate the principles of proportion, order, repetition, and unity (Hansel, n.d). For instance, when designing a pool, the constructure using landscaping architecture will develop sociable space around the pool to enable it to function as a resting and relaxation center. This increases the functions that a pool area can accommodate. Irrespective of the region, space, or condition, investing in landscape architecture allows parks to attract individuals with different tastes, preferences, ideologies, and sensitivities because the modern designers focus on developing outdoor infrastructures that appeal to relevance. As part of urban planning and lifestyle, designing aquatic pools to offer an escape from the harsh and demanding work life that many people endure forces the park management to invest in landscape architecture.

2.5 Public City Pools

2.5.1 Fort Worth Public Pools

Aquatic parks not only encompass swimming pools but also wading pools, spa pools, paddling pools, and particular purpose pool facilities that are within the public domain (McLauchlan, 2017). The increasing relationship between human and aquatic recreational parks is immensely emotional. These aquatic parks are essential in alleviating depression, reducing stress, improving concentration skills, and enhancing self-esteem. Fort Worth aquatic parch faced significant transformation since the mass closure of many pools in the city (Zavala, 2014).

Table 2-2 Inactive Public City Pools

PUBLIC POOLS	POOL TYPE	YEAR BUILT	ACTIVE
Sycamore Park	Community	1926	NO
Sylvania Park	Community	1936	NO
Como Park	Community	1957	NO
Kellis Park	Neighborhood	1960	NO
Hillside Park	Community	1960	NO

The low maintenance of many aquatic parks and facilities in the city forced the local government to close major aquatic parks. For instance, the city had attractive pools in the ‘70s and ‘80s, which attracted

people from all over the city during summer weekends, such as Lake Como Park Pool on the west side of Fort Worth (McLauchlan, 2017).

The current aquatic park in Fort Worth has standard and creative features that attract consumers. Moreover, the city has ensured that the aquatic parks follow the federal and local policies to guarantee the health and safety of the public (Zavala, 2014). Despite the city accommodating more than 870,000 residents (about half the population of Idaho), it only has two functional public pools that serve the whole African American predominant community. The poor maintenance of many public pools in the city forced the local government to close many swimming pools. Currently, the city of Fort Worth, Texas, faces an active demand for accessible, healthy, and safe swimming pools to enable the young populace to facilitate recreational activities (Zavala, 2014). Although there is a high demand for aquatic facilities, the city of Fort Worth is struggling to accommodate all the thousands of customers utilizing its few recreational facilities.

2.5.2 Forest Park Public Pool

Forest Park Swimming Pool is the oldest aquatic facility, having been constructed in 1922 (Kimley-Horn & Associates, Inc., 2013).

Figure 2-5 Forest Park Public Pool Ft. Worth, TX

The park has several recreational facilities, including a small water slide, three-lap lanes, a wading area for small children, and a new diving board. An assessment done to determine the quality standards at the park revealed several deficiencies.

Primarily, the vinyl liner had been damaged completely, and the overall pool's integrity seemed in disrepair. All pool equipment including pool pumps, filters, sanitizers, lights and pvc piping were also obsolete. Besides, the pump and filters were incompatible. Instead of being demolished, the assessors recommended that the pool be repaired, to meet the recommended quality standards. Consequently, the city council parted with $661,000 to repair the pool in 2013 (Hirst, 2014). The closure of the six parks in the fiscal year of 2009 placed significant pressure on the remaining pools in Fort Worth as it struggled to accommodate the massive population and increased demand for recreational water activities (AMP, 2013).

For example, many residences from different classes, gender, race, and preference continued streaming into the 90-year-old Forest Park pool, placing pressure, not only on the management, but also on the vulnerable infrastructure. Although Forest Park survived the 2009 demolition sanction, it faced significant problems such as the failure of its vinyl liners, broken filter laterals, failing decks, failing slides of the diving boards, and incompatible pump and motor. These setbacks placed high health and safety risk on clients who could easily injure themselves while swimming or engaging in other water recreational related activities (AMP, 2013).

In 2010, the Forest Park was closed due to inadequate funds to facilitate the repair and maintenance of the pool elements, which posed health and safety risks to swimmers and other visitors (Alanis, 2011). Nonetheless, after pursuing a public-private partnership, the park re-opened in 2013 with new and improved facilities and infrastructure included small water slides and a new diving board. There's also a wading area for small children and three lap lanes. Although recreational stakeholders may want pools to last for long without substantial faults, the pools are prone to get damaged eventually.

While this is normal for any manufactured object, repairability coverage in ensuring the pool and pool equipment continues to function and promote recreational activities as expected (Bracquene et al., 2019). Repairability encompasses the ability for damaged products, equipment, system, or a machine to be restored into effective functionality within a specified period. The first phase of Forest Park was dominated by massive repairs; later, it was closed in 2010. This enabled the park to function promptly before the massive investment was placed on constructing a new and modern Forest Park Aquatic Center.

2.5.3 Marine Park Public Pool

The Marine Park Pool has an interactive play framework with tipping buckets, water cannons, four lap lanes, a large slide with a *run-out* flume, 3200 square foot bathhouse, and infant/toddler changing areas. Also, the park is equipped with seven shade structures, and vending machines. Just like the Forest Park Pool, an evaluation of the Marine Park Pool also revealed serious quality issues. Particularly, the piping system was in a poor state, and the decks were also cracked. Marine Park Pool was later demolished and rebuilt for $3.2 million in 2012 (Hirst, 2014).

Figure 2-6 Marine Public Pool Ft. Worth, TX

Marine Creek Park attracted many people during the sweltering summer. It was also a popular picnic for most people in 1909 after the approval of a lack in the park in 1910, but with little to no rainwater to fill the lake, it turned into a breeding ground for mosquitoes (Zavala, 2014). This park served inner city families within the community for generations until it lost its aesthetic appeal. Built to accommodate approximately 350 swimmers in a session, it provided an exclusive environment for fun and relaxation (Zavala, 2014). The Marine Park pool on the northern side of Fort Worth was demolished in 2012 to construct a modern aquatic center worth approximately $3.2 million consisting of water slides, multi-use pools, a kiddie pool, and play features (Zavala, 2014). The major repairs like the re-modeling or replacement of the drain valves and piping systems, shell cracks, and bathhouse enabled Marine Park to restore its lost glory and attract many people, both local and foreign.

Table 2-3 Active Public City Pools

PUBLIC POOLS	POOL TYPE	YEAR BUILT	ACTIVE
Forest Park	Community	1922	YES
Marine Creek Park	Community	1926	YES

The new Marine Park aquatic center remains the newest city park opened in 2013. It encompasses unique family-friendly amenities that allow swimmers to enjoy their time in the city while parents relax watching their children (Zavala, 2014). For instance, Marine Park has features such as interactive play structures with water cannons, wet decks, large slides with run-out flumes, a 3,200 square foot bathhouse, vending machines, toddler changing areas, and seven shade structures. The facility also levies a small number of charges for parking. For example, it charges $5.00 for children between age 17 and below, $6.00 for adults, and $5.00 for former and current military members with required identification credentials (Zavala, 2014).

2.6 Fort Worth Public Pool Inventory

2.6.1 Active and Inactive Public Pools

Fort Worth residents have been relying on seven outdated municipal aquatic facilities, including the Sylvania Park Pool, Sycamore Park Pool, Lake Como Park Pool, Kellis Park Pool, Hillside Park Pool, Forest Park Pool, and the Marine Park Pool (Kimley-Horn & Associates, Inc., 2012). All the public pools in the city were built in different years within the last century. Forest Park Swimming Pool is the oldest aquatic facility, having been constructed in 1922, while the Hillside Park Pool, serving as the newest public pool, was built in 1960 (Hirst, 2014). In 2010, budgetary cuts and enormous operational expenses led to the closure of five of the city's aquatic facilities, leaving only the Marine Park Pool and the Forest Park Pool in use (Kimley-Horn & Associates, Inc., 2012). Both, the Forest Park, and the Marine Park pools, are situated on the north and south side of the city, approximately five miles from one another. David Creek, the Director of Parks and Community Services called for the demolition of the pools, for several reasons, including the high expenses incurred in their repairs, the safety risks that they imposed on swimmers, and the bad impression they created in the parkland (Hirst, 2014).

Fort Worth struggled to restore its fame in recreational water activities, it resorted to demolish and re-establish new parks that met the contemporary standards of the current society (AMP, 2013). From renovating the old parks to creating new and improved aquatic centers like the current Forest Park Aquatic Center, the city has significantly prompted a new direction to ensure increased water recreational activities as well as the health and safety of customers. Despite the financial constraints which led to the demolition of various parks, Fort Worth today, relies on public donations and financial support from

internal or local investors to facilitate the improvement and construction of new aquatic parks across the city (Zavala, 2014). To uplift the face of Fort Worth, the city requires half a million, which has forced the city to resort to the help and support of the private sector to assist in facilitating such a huge project.

As of 2013, many aquatic centers in Fort Worth were significantly old and had outlasted their durability (Floryan et al., 2020). As an essential part of the recreational water industry, the old nature of many pools in the city failed to attract the public as the pathetic conditions, not only threatens the health of many swimmers due to the risk of getting injuries, but also life (Pollard et al., 2013). Particularly, before demolition, the existing and well-known aquatic parks in Fort Worth included: Sycamore, which was approximately 86 years old, Sylvania (76 years old), Como (55 years old), Hillside, and Kellis (both 52 years old) (Zavala, 2014). These parks significantly served the residents in the city of Fort Worth for generations, not only as recreational centers, but also as sports championships and Olympic competitions grounds.

Additionally, most of these parks were either community parks or neighbourhood parks that were significantly accessible and occupied between 30 to 500 acres of land within the residential communities (Alanis, 2011). They stretch at a radius of one and a half miles to serve 18,000 to 36,000 in population for community parks and 3,000 to 6,000 in population for neighbourhood parks. For instance, Lake Como aquatic park was a community park within the Como Community (Alanis, 2011). Nonetheless, as the society advanced and the need for creativity and modernization emerged, capturing the recreational water industry, there is a need to re-establish the swimming pool facilities to meet the technological standards and modern creativity to appeal to aesthetics and guarantee customer attraction (Waller et al., 2018). The city of Fort Worth aimed to restore its lost glory in the pool and aquatic park industry (Alanis, 2011).

The nature of aquatic parks like the Hillside, Como, and Sylvania, among others, forced the city, after the recommendation of the audit report of the condition of the pools, to take extreme measures of many aquatic parks (AMP, 2013). Except for Forest Park and Marine Park, which had substantial maintenance capability and potential to advance to the future, the city stopped facilitating funding for the improvement of the public aquatic parks and sanctioned the demolition of six parks in Fort Worth in 2009 (Alanis, 2011). This resulted in the immediate elimination of these parks from the community area.

Moreover, the audit report highlighted the specific reasons why these aquatic city parks qualified for demolition without any alternative considerations (Alanis, 2011).

2.7 Summary and Conclusion

In this Master design thesis, the literature review illustrated that public pools functioned as big bath used by poor and immigrants and evolved to become recreational destinations for family gatherings. Eventually legal and social desegregation let to the private swimming pools in the second half of the century White middle-class Americans used backyard pools while Latinos and blacks swam in their respective municipal pools.

The approach of public was to provide public safety to prevent drownings, so pool fences and barriers had to be a certain height. According to a study of the National Sporting Goods association statistics show that 90% of all public city pools are recreational groups and another study by Cousilman-Hunsaker revealed that recreational aquatics amenities accounts for 75% of the total revenues derived from aquatics. Landscape architecture and public city pools focus on the arrangement of land, water, plant forms, and structures for the best and greater enjoyment. Public pool landscaping includes installations of features such as pool fencing, lighting, decking, paving and furniture captivating aesthetics, safety, lifestyle, and functionality. Fort Worth has only two recreational public pools in use after five such facilities were closed for obsolescence. Besides Marine Park pool, the only existing pool in the south side of the city is Forest Park public pool. However, the outdatedness was compelling the city authorities to incur excessive costs in repairs.

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Chapter 3

Methodology

3.1 Introduction

This chapter details the research design and the methodologies used in the collection and analysis of data. Also, the demographic characteristics of the areas are documented. To design a recreation public city pool, this study followed a systematic process to collect and analyze the data of study's population and age distribution successfully and effectively (AMP,2013). Together with the review of the literature design recommendations and site extensive documentation was subsequently done, and various case studies examined. Data analysis was then conducted, and the findings were used to inform the design program for the new Forest Park Community Public Pool.

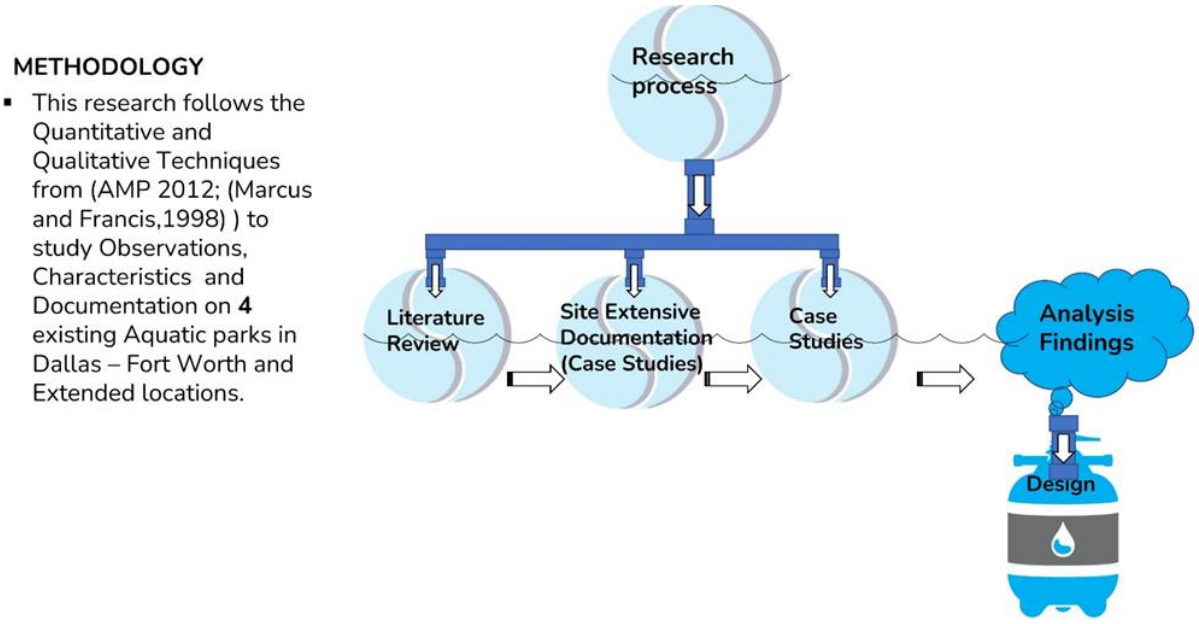


Figure 3-1 Methods Process

3.2 Research Design

This research follows the quantitative and qualitative techniques from (1998) Marcus, C. C., & Francis, C. P.166(1998) and (City-Wide Aquatic facilities master plan Update 2012) quantitative process. These case studies include location and context, Description, Major Uses and Users and successful and unsuccessful features. These observations will document existing public pools in Fort Worth, TX to study observations, characteristics, and documentation on a total of four existing aquatic parks. Two in Dallas – Fort Worth, TX and two in extended locations, one in Bytown, Texas and the other in Statesboro, Georgia. First, literature review was introduced on pool design principles of recreational public pools. Second, site extensive case studies (AMP, 2013) and two case studies (Marcus & Francis, 1998) documentation, site photos and context characteristics of two local public pool case studies.

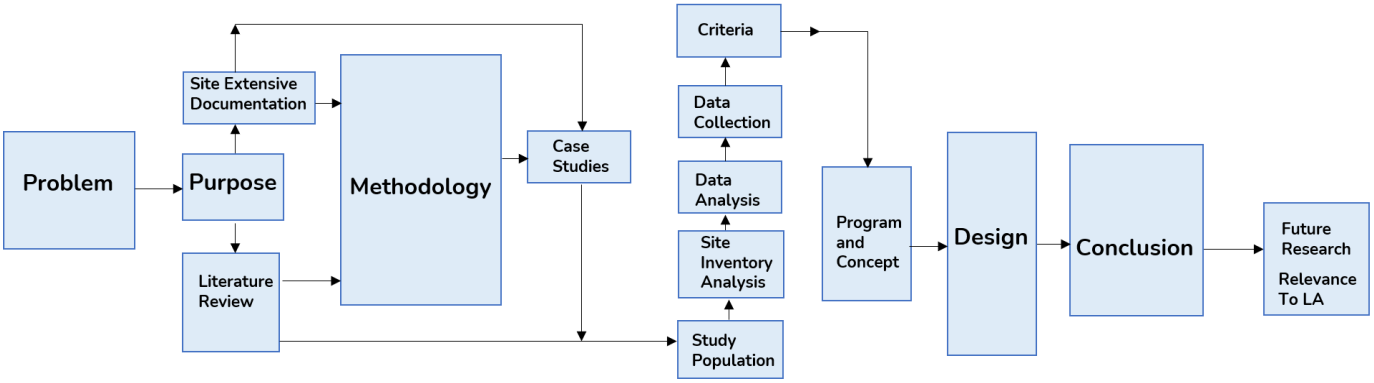


Figure 3-2 Research Design

3.3 Study Population and Age Group

The study was conducted in Fort Worth, Texas. Fort Worth is the 5th largest city in Texas. In 2015, the city had 772,800 residents (Demographics Now, 2015). The south side of Fort Worth has 116,800 residents (Demographics Now, 2015). The study's population will focus on an area with a three-mile distance ring surrounding south Fort Worth, Texas (C/H-K-H&A). The study's population will focus on various age groups with a three-mile radius surrounding south Fort Worth, Texas within the Forest Park

area.

MARKET AREA POPULATION 3 and 5 MILE RADIUS										
	Population						Average Annual Change			
	2000		2010		2015		2000-2010		2010-2015	
Radius	3 Mile (000's)	5 Mile (000's)	3 Mile (000's)	5 Mile (000's)	3 Mile (000's)	5 Mile (000's)	Number (000's)	Percent Percent	Number (000's)	Percent Percent
North	6.6	61.0	54.1	155.2	73.2	191.8	4.7	23.4%	3.8	6.2%
Central	54.2	180.6	64.4	225.1	70.2	250.9	1.0	1.7%	1.2	1.8%
South	83.4	164.4	106.3	198.3	116.8	214.7	2.3	2.5%	2.1	1.9%
East	61.2	190.2	66.5	203.5	71.4	218.1	0.5	0.8%	1.0	1.4%
West	38.8	80.9	49.3	97.4	57.7	110.5	1.1	2.4%	1.7	3.2%
Fort Worth, TX	541.0		688.8		772.8		14.8	2.4%	16.8	2.3%
Source: Demographics Now										

Source: (Demographics Now)

Market area Population South 3-Mile Radius

MARKET AREA AGE DISTRIBUTION 2.5 MILE RADIUS													
Age Groups	North		Central		South		East		West		Fort Worth, TX		Total U.S.
	#	%	#	%	#	%	#	%	#	%	#	%	
Age 0 to 4	4,709	8.7%	5,888	9.2%	8,386	7.9%	5,843	8.8%	4,532	9.2%	60,218	9.8%	6.9%
Age 5 to 9	5,211	9.6%	5,644	8.8%	8,566	8.1%	5,120	7.7%	3,908	7.9%	55,905	9.1%	6.7%
Age 10 to 14	4,853	9.0%	5,227	8.1%	8,200	7.7%	4,382	6.6%	3,438	7.0%	50,482	8.2%	6.5%
Subtotal	**14,773**	**27.3%**	**16,759**	**26.0%**	**25,152**	**23.7%**	**15,345**	**23.1%**	**11,878**	**24.1%**	**166,605**	**27.0%**	**20.1%**
Age 15 to 19	3,618	6.7%	5,244	8.1%	7,633	7.2%	3,991	6.0%	3,312	6.7%	48,693	7.9%	6.7%
Age 20 to 24	2,935	5.4%	5,115	7.9%	6,579	6.2%	4,696	7.1%	3,776	7.7%	50,512	8.2%	6.9%
Age 25 to 29	3,940	7.3%	5,056	7.9%	7,344	6.9%	5,311	8.0%	3,798	7.7%	53,817	8.7%	7.0%
Age 30 to 34	4,542	8.4%	5,088	7.9%	7,444	7.0%	5,053	7.6%	3,602	7.3%	52,479	8.5%	6.6%
Age 35 to 39	4,502	8.3%	4,304	6.7%	7,561	7.1%	4,468	6.7%	3,339	6.8%	47,787	7.7%	6.5%
Age 40 to 44	4,076	7.5%	3,897	6.1%	7,531	7.1%	4,242	6.4%	3,306	6.7%	45,271	7.3%	6.7%
Age 45 to 49	3,980	7.4%	3,916	6.1%	7,580	7.1%	4,391	6.6%	3,319	6.7%	45,546	7.4%	7.1%
Age 50 to 54	3,712	6.9%	3,510	5.5%	7,155	6.7%	4,195	6.3%	3,105	6.3%	42,051	6.8%	7.1%
Age 55 to 59	2,571	4.8%	2,955	4.6%	5,964	5.6%	3,573	5.4%	2,743	5.6%	35,308	5.7%	6.4%
Age 60 to 64	2,037	3.8%	2,519	3.9%	4,675	4.4%	2,864	4.3%	2,200	4.5%	29,094	4.7%	5.4%
Age 65 to 69	1,411	2.6%	1,911	3.0%	3,805	3.6%	2,239	3.4%	1,599	3.2%	22,180	3.6%	4.2%
Age 70 to 74	789	1.5%	1,442	2.2%	2,887	2.7%	1,816	2.7%	1,092	2.2%	16,452	2.7%	3.1%
Age 75 to 79	508	0.9%	1,081	1.7%	2,151	2.0%	1,553	2.3%	848	1.7%	12,478	2.0%	2.4%
Age 80 to 84	351	0.6%	788	1.2%	1,530	1.4%	1,296	1.9%	666	1.4%	9,921	1.6%	1.9%
Age 85 Plus	311	0.6%	762	1.2%	1,327	1.2%	1,502	2.3%	725	1.5%	10,579	1.7%	2.0%
TOTAL:	**54,056**	**100.0%**	**64,347**	**100.0%**	**106,318**	**100.0%**	**66,535**	**100.0%**	**49,308**	**100.0%**	**617,163**	**100.0%**	**100%**
Median Age	32.0		30.0		34.3		34.2		32.6		32.3		37.1
Source: DemographicsNow													

Source: (Demographics Now)

Age Distribution South 3-Mile Radius

Figure 3-3 Population & Age

3.4. Data Collection Methods

The data was collected through extensive documentation of the site case studies on recreational trend list. Four case studies were used to collect the required information. Data collection was achieved through a review of several case studies, case documentation, photos, plans, master plans, context and examining case characteristics. Specific sites were analyzed based on criteria given by the recreational

trend list (Counsilman-Hunsaker, 2012). An extensive review of literature on public city pools was also performed to obtain empirical data used to build and rationalize the study.

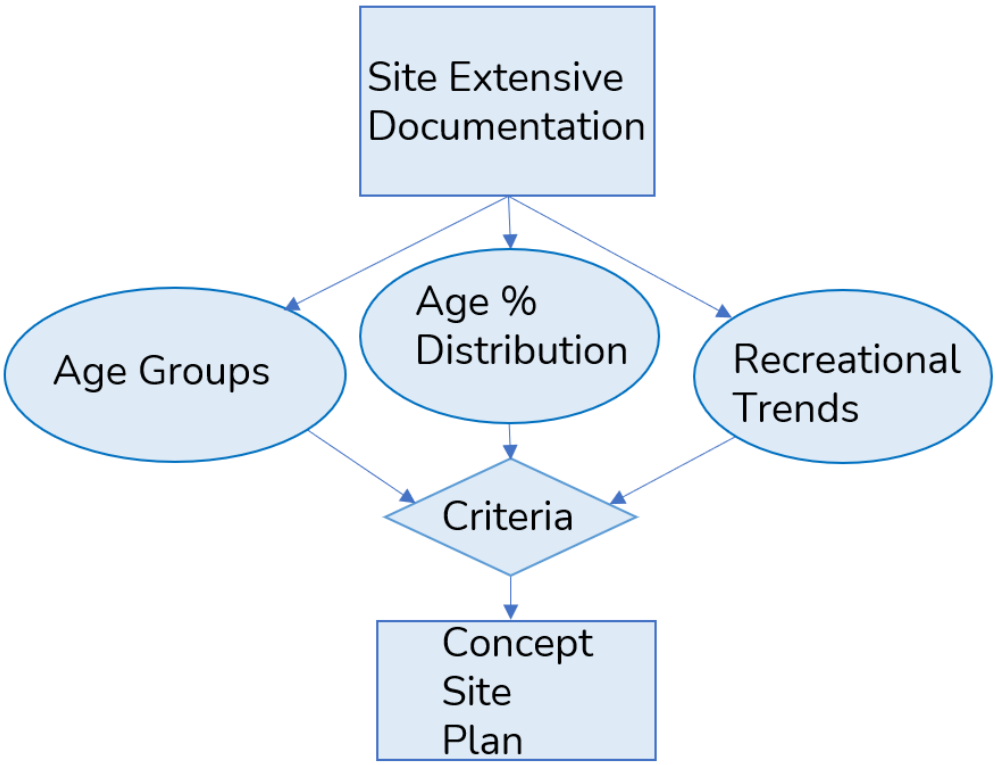


Figure 3-4 Data Collection Methods

3.4.1 Case studies

Four case studies were used to collect the required information. Collection was achieved through a review of several case studies in case documentation, photos, plans, master plans, context and examining case characteristics. All local and extended case studies were examined on the criteria given by the recreational trend list table (Counsilman-Hunsaker, 2012):

(1) Case Studies: 2 extensive documentation study design characteristics, location and context site photos and site components and programming data on local and extended public pools (AMP, 2013).

Case Studies: 2 case studies, observations, site visits, photos, secondary data on local and extended public pools (Marcus & Francis, 1998).

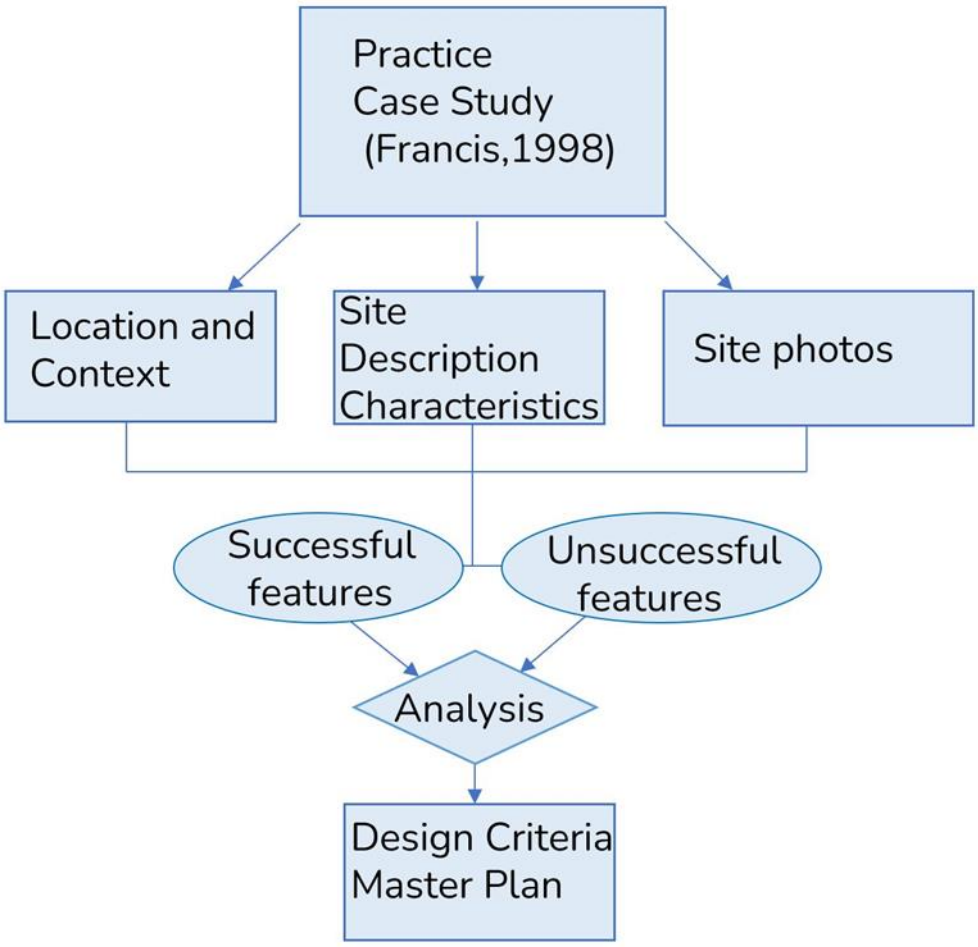


Figure 3-5 Collection Case Study

3.4.2 Case Study Extensive Documentation

Two of the case studies are in Arlington, Texas. One is the Randol Mill Community Public Pool and the other is Bad Königshofer Community Public Pool, where the researcher did extensive documentation on both sites based on the recreational amenities trend list. Based on the analysis of both websites, characteristics a design consideration weighted scale was given based on the use of public pool recreational amenities criteria program list.

3.4.3 Case Study Practice

Two of the case studies are located outside Dallas-Fort Worth. One is Pirates Bay Community Public Pool and the other is Splash in the Boro Community Public Pool, where the researcher use park website's data and information, internet maps, and other secondary documentation and compared to the

recreational amenities trend list. Based on the analysis of both websites' characteristics, a design consideration weighted scale was given based on the use of public pool recreational amenities criteria program list along with successful and unsuccessful recreational amenities trend list.

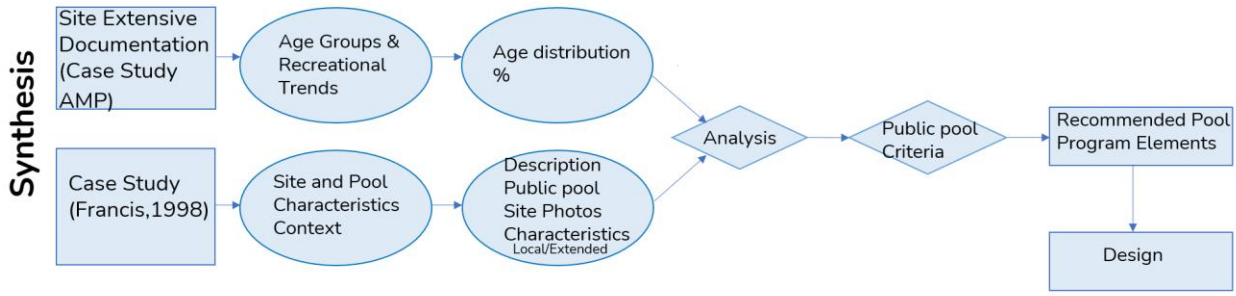


Figure 3-6 Extensive Case Study

3.5 Data Analysis Methods

In this section, all data gathered from the study's population, age group distribution, and data collection methods, will be analyzed and fragmented. All data gathered from four case studies along with literature on community public city pools gave researcher a design matrix to inform of recommended design program of what recreational pool amenities to include for a successful and effective new community public pool for Forest Park in the city of Fort Worth, Texas.

3.5.1 Case Studies Design Criteria

Table 3-1 Design Synthesis Criteria

City Age groups Census	Aquatic Age groups Trend	3 Mile Age distribution South Ft Worth Percentages %	Criteria
+	+	+	= ?
Source: (Demographics Now)	Source: (Counsilman-Hunsaker)	Source: (Demographics Now)	

3.5.2 Case Studies Design Program

The case studies are based on comparing two different class B public pools

One local pool and one external. In which comparing location, context, description, major uses, and users indicating Successful features and Unsuccessful features.

Table 3-2 Design Program

Recreational Public Pool Criteria	Case Study Public pool name Rank criteria	Case Study Public pool name Rank criteria	Recreational Description	Recommended Program Elements from Case studies (Weighted scale)
+	+	+	=	?

Source: (Demographics Now) Source: (Counsilman-Hunsaker)

3.6 Site Selection Process

The site was selected based on four main factors including connectivity, access, area, and location:

Figure 3-7 Site Location

Forest Park- Last Community Public Pool, South Fort Worth, Texas.

Connectivity- To major public and residential areas.

Access- To major street arteries and thoroughfares.

Park Area- 20 acres for potential facility expansion, open natural spaces, trails, and bike routes.

Park Location- Extensive population, eldest pool city standing.

3.7 Design Planning Process

All data gathered from case studies, literature review, and site documentation was considered for a suitable new Forest Aquatic Park design.

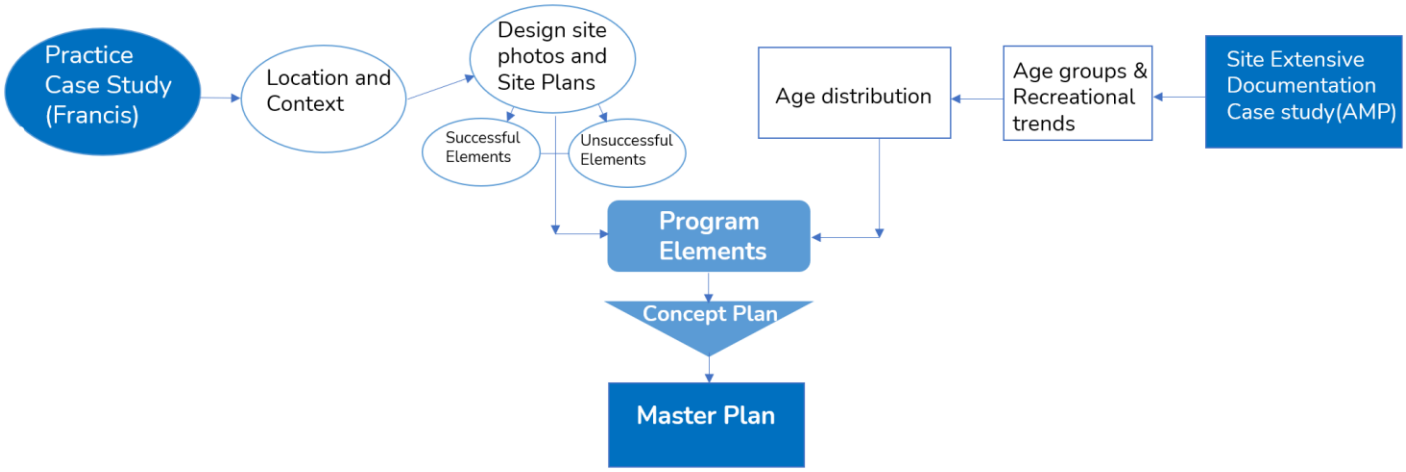


Figure 3-8 Design Process

3.8 Significance and Limitations

The secondary data were beyond the researcher's control, making the study prone to errors. Site visits can be biased in documentation, based on the time of the year, weather and availability of access to sites time and limiting access to pool sites locally and externally.

3.9 Summary

The chapter provided the methodology used in the study. A combination of qualitative and quantitative techniques was applied. Data collection was achieved through site visits and the retrieval of secondary material, including case studies. However, the secondary data were beyond the researcher's control, making the study prone to errors.

Chapter 4

Analysis and Findings

4.1 Introduction

This chapter provides the research findings and recommendations of the research methods used in chapter three for a new Forest Park Public City Pool design in Fort Worth, Texas. With data collection from literature and four case studies, a design matrix table was created to recommend the program elements.

4.1.1 Study Population and Age Group Criteria

The population base for the city of Fort Worth is 772,800 (84%) (Demographics Now, 2010). Age Distribution is the study population of four age groups within a three-mile radius surrounding South Fort Worth, Texas (Demographics Now, 2010).

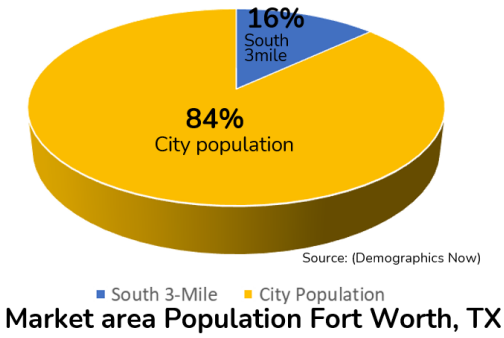
Source: (Google photos)

STUDY POPULATION

- The population base for the City of Fort Worth is 772,800(Demographics Now 2010)
- The population in South Fort Worth, TX is 106,800 (Demographics Now 2010)

AGE DISTRIBUTION

- The study population of 4 major age groups within a 3 mile radius surrounding in South Fort Worth TX. (Demographics Now 2010)



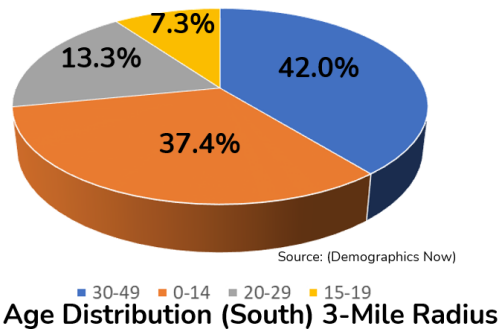


Figure 4-1 Population

The population in South Fort Worth, Texas is 116,800 being 16% of the total population of Fort Worth (Demographics Now, 2015). Analyzing the age distribution in the south side of the city in a three-mile radius, the four main age groups are as follows: The 0 to 14 is 23%, 15 to 19 is 7.2%, 20-29% is 13.1%, and 30 to 49% is 28.3%.These age group percentages total weighted against the recreational aquatic age group (Counsilman-Hunsaker, 2012) table, given the design pool considerations recreational amenity list to consider in the pool design in Forest Park Community.

Table 4-1 Trends: Age Population (2010)

3 Mile Age Groups South Ft Worth %	Recreational Aquatic Age groups Trend	3 Mile South Ft Worth Total %	Recreational Age Group Considerations	
			Recreational Trends List	Recreational Criteria
0-14 **37.4%**	0-3	**44.7%**	**tot pool, tot slides, spray features**	Tot pool Tot slides Spray features Splash pad Beach entry Play features sand play water walks play structures waterslides open water lazy river gathering places sand volleyball mat racer diving board
	4-7		**Splash pad, beach entry, play features, sand play**	
	8-11		**Water walks, Play structures, waterslides, open water**	
15-19 **7.3%**	12-16		**Water walks, waterslides, open water, lazy river, gathering places, sand volleyball, mat racer, diving board**	
20-29 **13.3%**	17-22	**13.3%**	**Action island, Intense waterslides, wave pool, mat racer, climbing wall, open water, sand volleyball, drop slides, diving board**	Wave pool Climbing wall Drop slides
30-49 **42.0%**	23-45	**42.0%**	**Beach entry, open water, spa, tanning ledge, lap pool, lazy river, waterslides, diving board**	Spa Tanning ledge Lap pool
	46 +		**Spa, tanning ledge, lap pool, lazy river, waterslides**	

Source: (Demographics Now) Source: Counsilman-Hunsaker

4.2 Case Studies

4.2.1 Case Study 1: Randol Mill – Community Public Pool

The first community public pool case study was the Randol Mill Pool in Arlington, Texas. The Randol Mill Family Aquatic Center offers aquatic recreation for all members of the family. The facility includes interactive recreation elements such as a shallow water play structure, vortex pools, current channel, water slide, and tot and leisure areas. The depth of pools ranges from zero depth to four feet deep. Other amenities include: two shade pavilions, shower facilities, deck furniture, and concessions.

Figure 4-2 Site Location 1

The successful features are the swim lessons area and lazy river with water features. Also, Family-friendly environment and space for expansion. The unsuccessful features are the waterslide on the separate body of water and a Help Center placement for guests.

Figure 4-3 Pool Amenities 1

4.2.2 Case Study 2: Pirate's Bay Water Park – Community Public Pool

Community Public Pool: Pirate's Bay Water Park, in Baytown, Texas. The description is that the facility has four winding slides, including one tube slide, a children's play area, and the long lazy river also winds throughout the park. Pirate's Bay also has a pavilion and cabana rentals.

Figure 4-4 Site Location 2

The successful features are park circulation, easy access, large parking areas, and extended facilities. The unsuccessful features are body slides and flow riders multiple tube slides.

Figure 4-5 Pool Amenities 2

4.2.3 Design Evaluation Criteria for Case Study 1 and 2

The evaluation and criteria for case studies 1 & 2 compares two class B public pools, one local and one external, where recreational and successful and unsuccessful pool amenities are compared and graded

in a weighted scale to determine the highest recommended program to design the new class B forest park pool

Table 4-2 Evaluation Criteria 1 & 2

Recreational Public Pool Criteria	Case Study 1 Randol Mill Park Community Pool Arlington, TX	Case Study 2 Pirates Bay Community Pool Baytown, TX	Recreational Description	Recommended Program Elements from case studies (Weighted scale)
Lap Pools	0	2	Essential to note that fitness lap swimming and water walking are important to many adults and seniors. Opportunities for limited practice and training exist in a two, three, or four lane 25-yard lap pool adjacent to leisure pool. Additionally, programming can be incorporated for lessons and group activities.	MEDIUM
Lazy Rivers	3	3	lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to leisurely enjoy the water.	HIGH
Waterslides	1	3	Waterslides provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water.	HIGH
Play Features	1	1	Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features, they control where and when the water sprays will occur.	MEDIUM
Leisure Pools	1	2	0 to 4 foot depth of leisure pools provides adults and children aquatic interaction, entertainment, relaxation and fun. With opportunity for many different sizes and designs, the leisure pool is a desirable attraction for all age and skill levels. Many different amenities can be incorporated for added amusement.	MEDIUM
Beach Entry	1	3	Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water. Instead of jumping or climbing into the pool, patrons simply walk in as they would at a beach.	HIGH
Climbing Walls	0	1	Fun alternative to slides and diving makes great addition to fitness and recreational programs	NON-EXISTENT
Shade Features	1	3	Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun	HIGH
Concessions	1	1	Access to food and drinks	MEDIUM
Dressing rooms-Rest rooms	1	1	Access to private clothe changing and Sanitary services	MEDIUM

SCALE: High-3, Medium-2, Low-1, Non-existent-0

4.2.4 Case Study 3: Bad KonigShofen – Community Public Pool

Community Public Pool- Bad Königshofer- Community Public Pool located in Arlington, Texas. The description is the pool features an interactive spray pad, shallow water play pool, lap pool, diving area, and two water slides. Other amenities include concessions, storage lockers, shower facilities, deck furniture, and a shade pavilion.

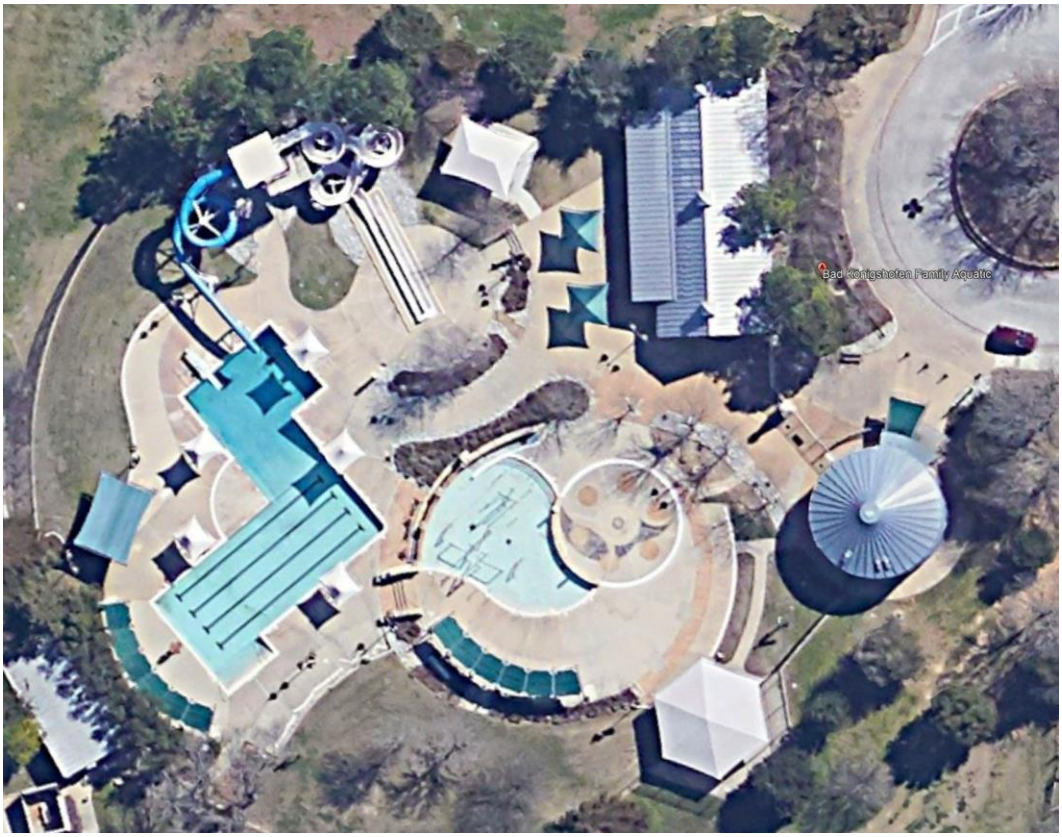


Figure 4-6 Site Location 3

The successful features are pool rentals, splash pad, and possible extended facilities. The unsuccessful features are far away concessions, diving board, and deep-water area.

Figure 4-7 Pool Amenities 3

4.2.5 Case Study 4: Splash in the Boro – Community Public Pool

Community Public Pool - Splash in the Boro- Community Public Pool located in Statesboro, GA. The description included within the park is an 800- foot pool that simulates a river and encircles the play and leisure pools. The park also contains a 25-meter lane pool and a 24,000-square-foot heated therapy pool. The park provides concessions with seating areas. Restrooms with family change areas and lockers are also located within the facility.

Figure 4-8 Site Location 4

The successful features are pool rentals, splash pad, possible extended facilities, Parking and accessibility to the site. The unsuccessful features are far away concessions, family gathering areas, and shaded public areas.

Figure 4-9 Pool Amenities 4

4.2.6 Design Evaluation Criteria for Case Study 3 and 4

The evaluation criteria below give this master design thesis the recommended design criteria to design the new class B public pool for Forest Park. By comparing two case studies with successful and unsuccessful amenities the weighted scale informs the researcher what program elements to include in the final master plan.

Table 4-3 Evaluation Criteria 3 & 4

Recreational Public Pool Criteria	Case Study 3	Case Study 4	Recreational Description	Recommended Program Elements from Case studies (Weighted scale)
	Bad Koniashofen Community Pool Arlington, TX	Splash-n-the-Boro Waterpark Statesboro, GA		
Lap Pools	3	3	Essential to note that fitness lap swimming and water walking are important to many adults and seniors. Opportunities for limited practice and training exist in a two, three, or four lane 25-yard lap pool adjacent to leisure pool. Additionally, programming can be incorporated for lessons and group activities.	HIGH
Lazy Rivers	0	3	lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to leisurely enjoy the water.	MEDIUM
Waterslides	2	3	Waterslides provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water.	HIGH
Play Features	2	1	Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features, they control where and when the water sprays will occur.	MEDIUM
Leisure Pools	2	2	0 to 4 foot depth of leisure pools provides adults and children aquatic interaction, entertainment, relaxation and fun. With opportunity for many different sizes and designs, the leisure pool is a desirable attraction for all age and skill levels. Many different amenities can be incorporated for added amusement.	HIGH
Beach Entry	2	3	Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water. Instead of jumping or climbing into the pool, patrons simply walk in as they would at a beach.	HIGH
Climbing Walls	0	1	Fun alternative to slides and diving makes great addition to fitness and recreational programs	NON-EXISTENT
Shade Features	2	3	Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun	MEDIUM
Concessions	1	1	Access to food and drinks	MEDIUM
Dressing rooms-Rest rooms	1	1	Access to private clothe changing and Sanitary services	MEDIUM

SCALE: High-3, Medium-2, Low-1, Non-existent-0

4.2.7 Design Considerations for Forest Park Public Pool

This table informs the pool designer what are the recommended recreational amenities to consider for the new public pool design. In this case the weighted scale having the highest criteria will be used as a design element.

Table 4-4 Design Considerations

Recreational Public Pool Criteria	Case Study 3	Case Study 4	Recreational Description	Recommended Program Elements from Case studies (Weighted scale)
	Bad Konigshofen Community Pool Arlington, TX	Splash-n-the-Boro Waterpark Statesboro, GA		
Lap Pools	3	3	Essential to note that fitness lap swimming and water walking are important to many adults and seniors. Opportunities for limited practice and training exist in a two, three, or four lane 25-yard lap pool adjacent to leisure pool. Additionally, programming can be incorporated for lessons and group activities.	HIGH
Lazy Rivers	0	3	lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to leisurely enjoy the water.	MEDIUM
Waterslides	2	3	Waterslides provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water.	HIGH
Play Features	2	1	Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features, they control where and when the water sprays will occur.	MEDIUM
Leisure Pools	2	2	0 to 4 foot depth of leisure pools provides adults and children aquatic interaction, entertainment, relaxation and fun. With opportunity for many different sizes and designs, the leisure pool is a desirable attraction for all age and skill levels. Many different amenities can be incorporated for added amusement.	HIGH
Beach Entry	2	3	Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water. Instead of jumping or climbing into the pool, patrons simply walk in as they would at a beach.	HIGH
Climbing Walls	0	1	Fun alternative to slides and diving makes great addition to fitness and recreational programs	NON-EXISTENT
Shade Features	2	3	Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun	MEDIUM
Concessions	1	1	Access to food and drinks	MEDIUM
Dressing rooms-Rest rooms	1	1	Access to private clothe changing and Sanitary services	MEDIUM

SCALE: High-3, Medium-2, Low-1, Non-existent-0

4.2.8 Design Program Elements for Forest Park Public Pool

Lap Pool. Essential to note that fitness lap swimming and water walking are important to many adults and seniors.

Lazy River. Lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour.

Waterslides. Waterslides provide excellent recreation value and come in many shapes and sizes. High-thrill swirl slides spin patrons around before shooting them down into the water.

Leisure Pools. 0 to a 4-foot depth of leisure pools provide adults and children with aquatic interaction, entertainment, relaxation, and fun. The leisure pool is a desirable attraction for all ages and skill levels.

Beach Entry. Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water.

Shade Features. Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun.

Play Features. Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. Chains and ropes can be manipulated and transformed by imagination. As children interact with these features, they control where and when the water sprays will occur.

Concessions. Access to food and drinks inside the water park.

Dressing Rooms. Access to dressing rooms for security inside the water park.

Restrooms. Access to sanitary facilities inside the water park.

4.5 Summary and Synthesis of Case Study Data

The chapter provided this master design thesis the findings used in literature review, case studies, study population, the age distribution, and two methods: one the practice case study (Francis,1998) and second, the site extensive documentations (AMP, 2013) for the design of a public swimming pool in the city of Fort Worth, Texas. The data was then inputted into a matrix that included age group distribution in a 3-mile radius of Forest Park public pool. Next, it included the recreational aquatic age groups trend along with case studies of public pools in the DFW area and two external public pools. The matrix was then synthesized in high, medium, low, and non-existent criteria to create a recommended program for swimming pool elements to design a new public pool in Forest Park of Fort Worth, Texas.

PROGRAM ELEMENTS FOR
Forest park Community Pool:

- **Lap Pool-** Essential to note that fitness lap swimming and water walking are important to many adults and seniors
- **Lazy River-** Lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour.
- **Waterslides-** Waterslides provide excellent recreation value and come in many shapes and sizes. High-thrill swirl slides spin patrons around before shooting them down into the water.
- **Leisure pools-** 0 to 4 foot depth of leisure pools provides adults and children aquatic interaction, entertainment, relaxation and fun, the leisure pool is a desirable attraction for all age and skill levels.
- **Beach Entry-** Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water.
- **Shade features-** Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun.

PROGRAM ELEMENTS FOR:
Forest park Community Pool

- **Play features-** Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features ,they control where and when the water sprays will occur.
- **Concessions-** Access to food and drinks inside the water park.
- **Dressing rooms-** Access to dressing rooms for security inside water park.
- **Restrooms-** Access to sanitary facilities inside water park.

Chapter Summary

In Summery this chapter gave the researcher the criteria to include the specific recreational amenities for a class B pool design in forest park in south Fort Worth, Texas. The data collected from literature review, case studies along with study population and age distribution were then synthesized to recommend a successful class B public pool.

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Chapter 5

Design

5.1 Introduction

The design chapter includes all synthesized data and suggested design characteristics from the literature review site intensive studies of public pools inside and outside the Dallas-Fort Worth area using photos, maps, plans, site descriptions, and other secondary data. This chapter also presents site inventory and site analysis of Forest Park pool, including circulation, land use, hydrology, and existing park amenity inventory. Additionally, it concludes with the program design elements for the new Forest Park Community public pool, concept design, and the master plan of the pool design with 3-dimensional pool design renderings to illustrate the new Forest Park Community public pool study.

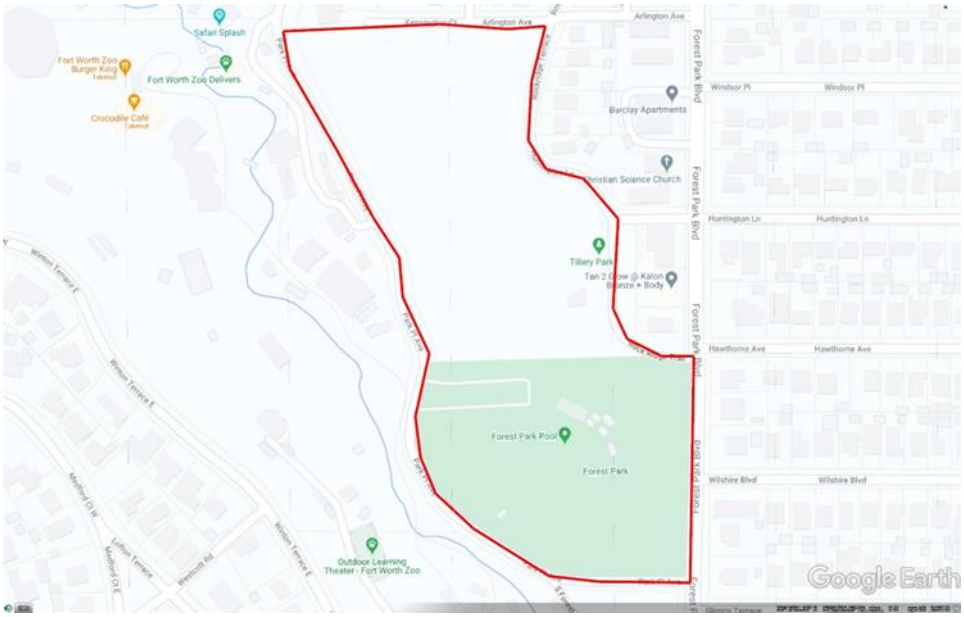

Figure 5-1 Selected Site Map

5.2 Selected Site

Forest Park- Last community public pool, South Fort Worth, TX.

Connectivity- To major public and residential areas.

Access- To major street arteries and thoroughfares.

Park Area- 20 acres for potential facility expansion, open natural spaces, trails, and bike routes.

Park Location - Extensive population, the eldest pool city standing.

Figure 5-2 Selected Site 2

5.3 Regional Context

The site is in Fort Worth, Texas. Tarrant County is about two miles south of downtown Fort Worth. The major interstate is I-35 about two miles to the east and I-30 about one and a half miles to the north. The pool is in Forest City Park surrounded by the Fort Worth Zoo and commercial and residential land uses. The pool is on the corner of Forest Park Blvd. and Park Place Avenue in south Fort Worth.

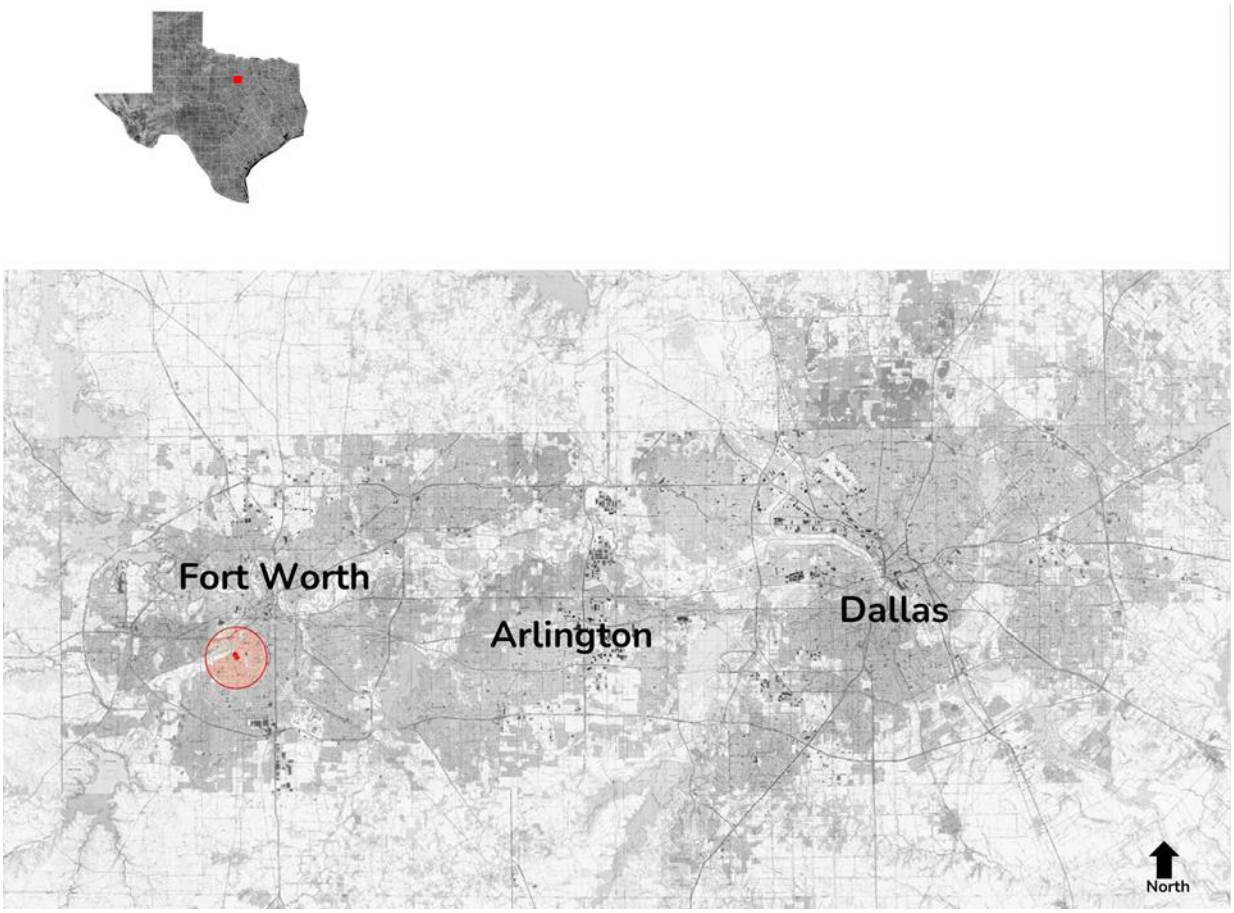

Figure 5-3 Regional Context

Figure 5-4 Forest park Area Map

5.4 Site Inventory and Analysis

Although the site was already selected, the site inventory helps determine what existing amenities exist and any potential amenities study recommends. Analysis through GPS (Global Positioning System) city maps helps understand site conditions in human and abiotic studies. As well as how it will impact the proposed master plan design.

Circulation:

Forest Park is between Forest Park Blvd, Park place avenue and colonial parkway in south Fort Worth, Texas. It is located two main arteries of Forest Park Blvd. and University Drive and is located around two major nodes (1) Texas Christian University and The Fort Worth Zoo. The nearest public transportation access is on University Drive close to the Zoo. All major primary and secondary roads around Forest Park are accessible by bicycle routes.

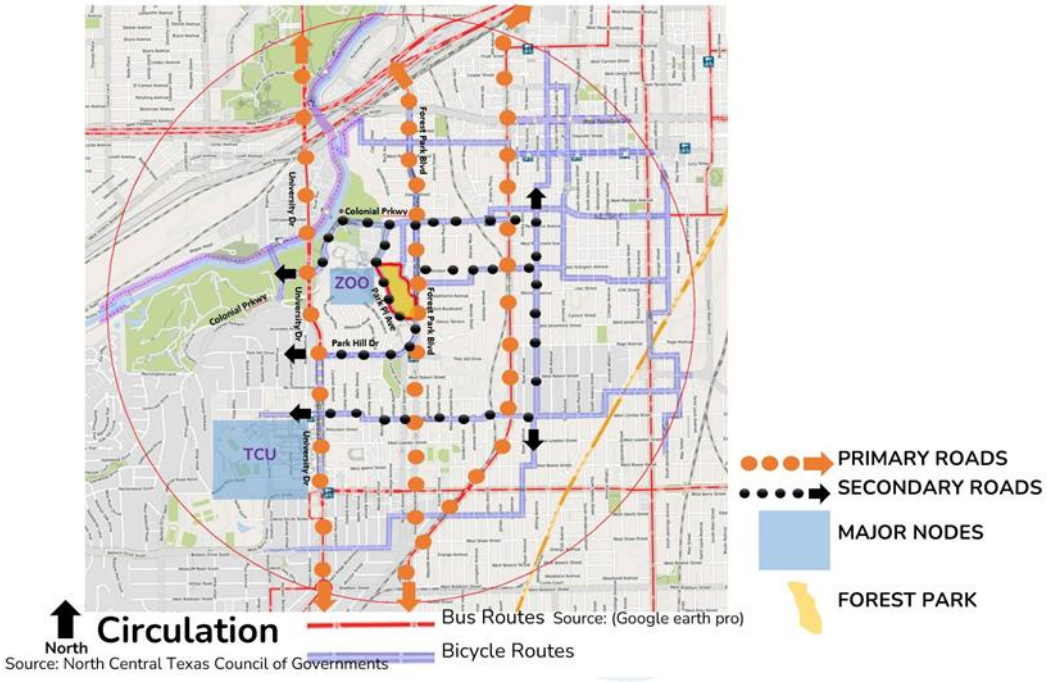

Figure 5-5 Circulation

Land Use:

The Land use around Forest Park is mainly Single -family, Multifamily and Commercial use.

Approximately 16% of the population in Fort Worth live the south side in a 3-mile radius according to (Demographics now 2010) population and is divided by two largest age distribution

One is 0-14 years at 37.4% and 30 to 49 at 42%.

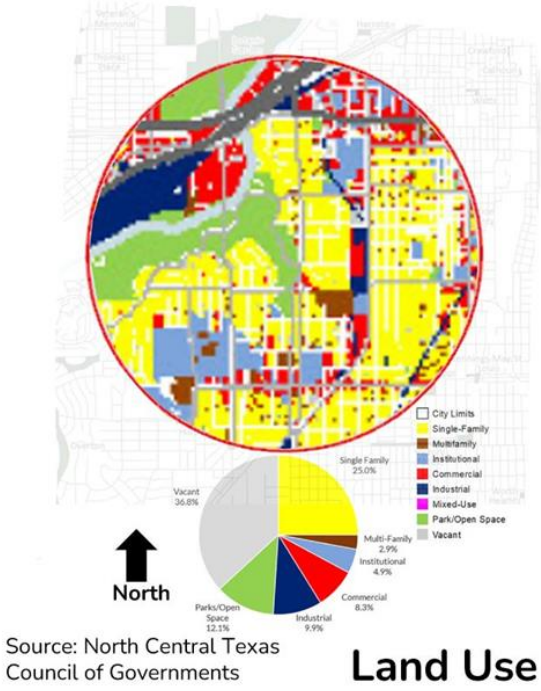

Figure 5-6 Land Use

Hydrology and Parks:

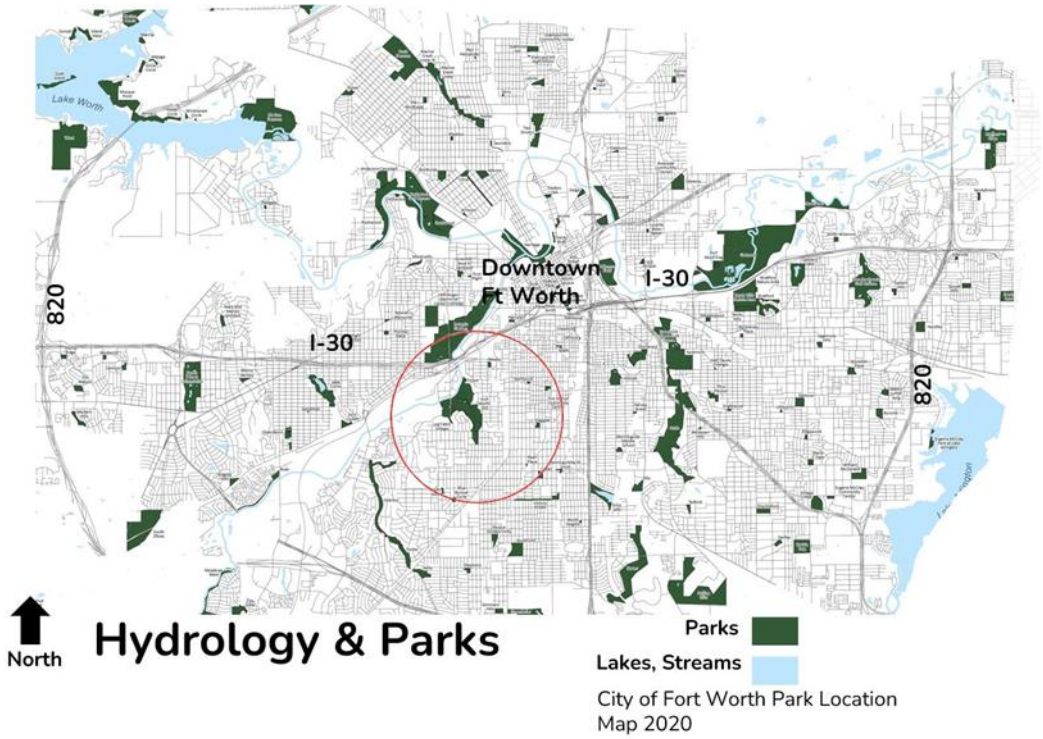

Figure 5-7 Hydrology

Site Inventory Views:

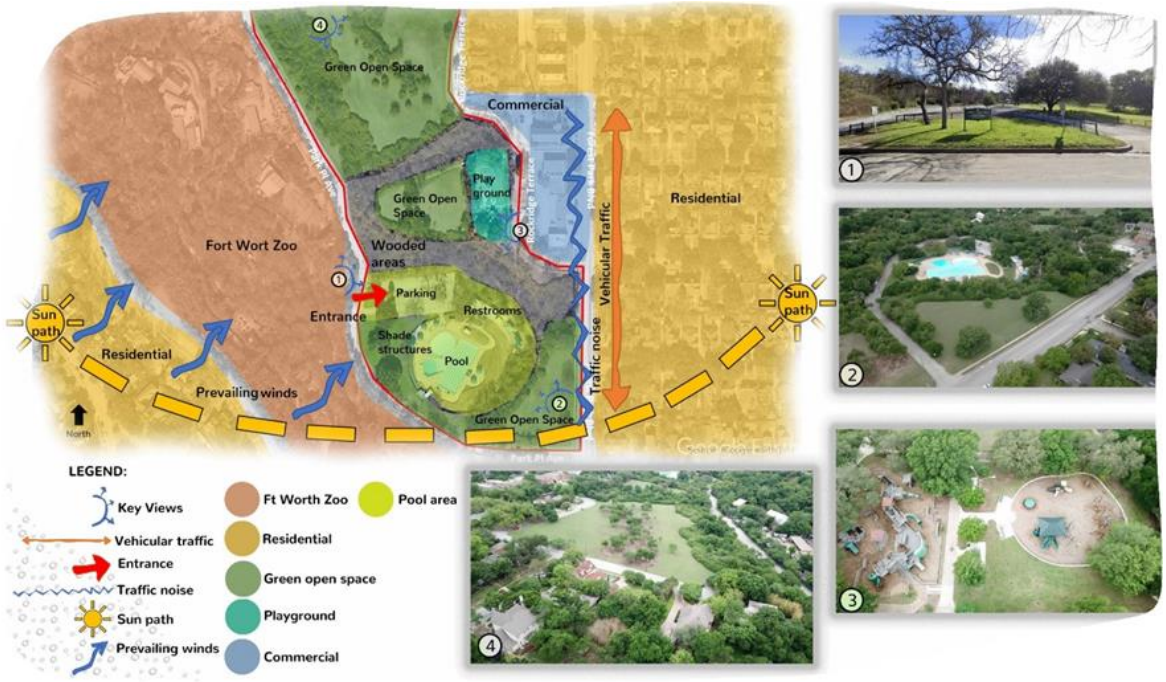

Figure 5-8 Site Inventory 1

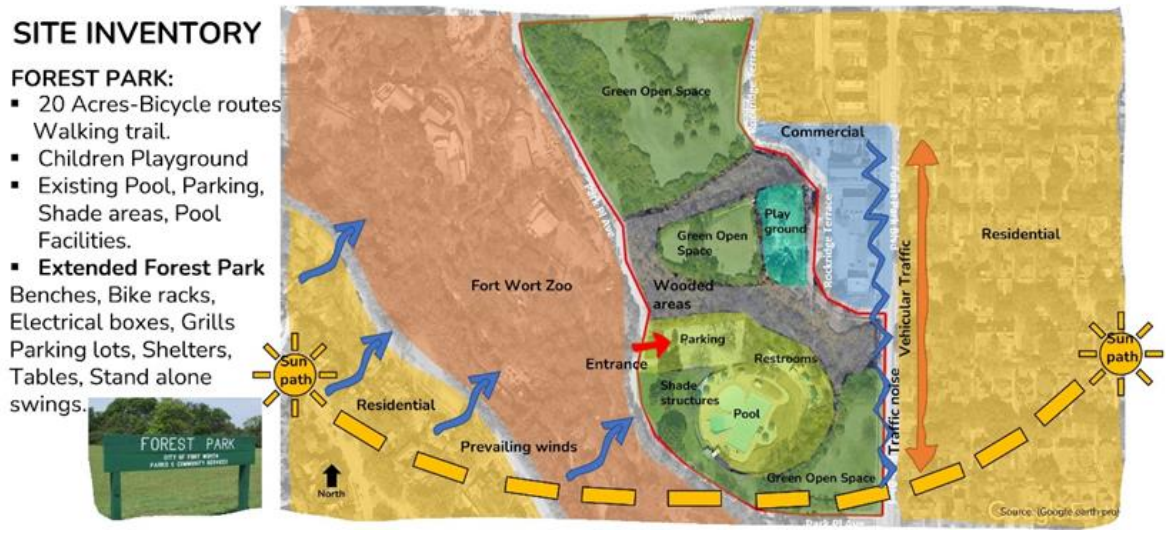

Figure 5-9 Site Inventory 2

5.5 Program Elements

In this community public pool design, the program elements dictate the overall design of the pool. This order begins with a lap pool which helps fitness in adults for exercises such as lap swimming and

water walking. Lazy river is a slow-moving water channel that takes its users on a loop ride along the pool's special characteristics. Waterslides include open and enclosed slides. Leisure pools encourage kids and adults to interact, entertain, and relax. Beach entry simulates ocean beaches from zero depth entry to gradual slope-in to swimming pool.

Shade features come in many fashions and encourage kids and adults to stay away from direct sunlight on scorching summer days. Play features bring recreational value to public pools with different attractions, such as: spray water guns, slides, and car wash tunnels of spraying water; and tumbling buckets. Concessions, dressing rooms and restroom facilities all add valuable services to the Forest Park Recreational Public Pool for all its intended users.

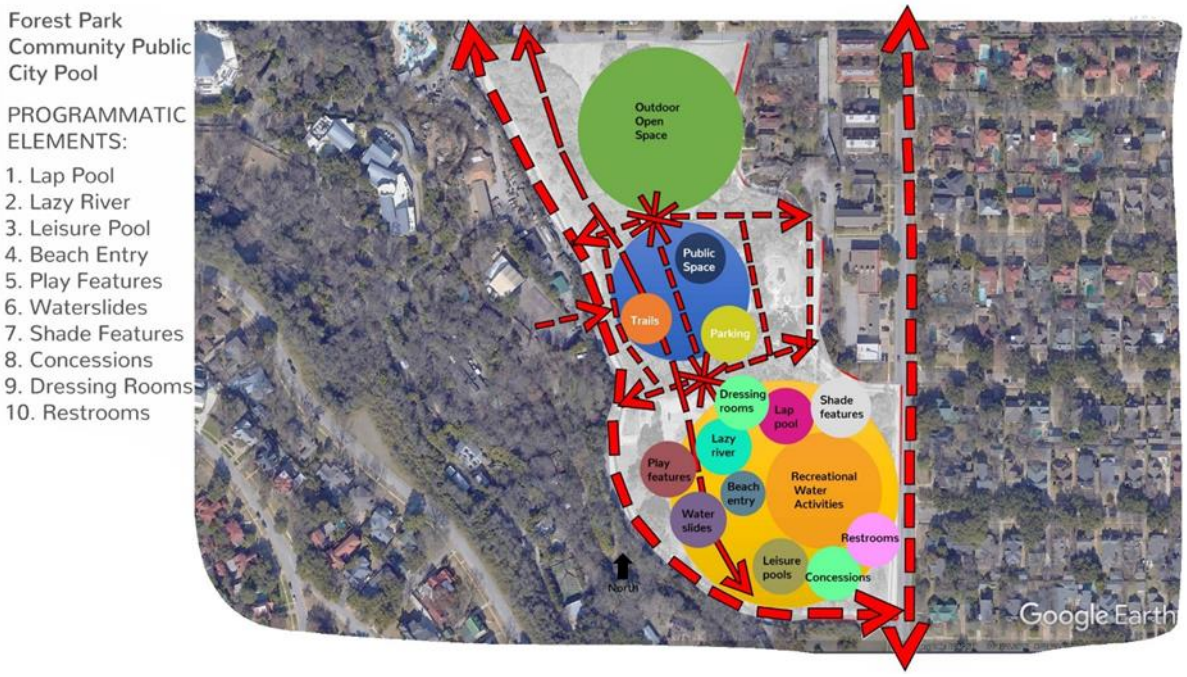

Figure 5-10 Program Elements

Lap Pool. Essential to note that fitness lap swimming and water walking are essential to many adults and seniors.

Lazy River. Lazy River is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour.

Waterslides. Waterslides provide excellent recreation value and come in many shapes and

sizes. High-thrill swirl slides spin patrons around before shooting them down into the water.

Leisure Pools. Zero to a 4-foot depth of leisure pools provide adults and children with aquatic interaction, entertainment, relaxation, and fun. The leisure pool is a desirable attraction for all ages and skill levels.

Beach Entry. Zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water.

Shade Features. Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the sun.

Play Features. Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. Chains and ropes can be manipulated and transformed by the imagination. As children interact with these features; they control where and when the water sprays will occur.

Concessions. Access to food and drinks inside the water park.

Dressing Rooms. Access to dressing rooms for security inside the water park.

Restrooms. Access to sanitary facilities inside the water park.

5.6 Concept Design

The overall concept design is based on the site inventory and site analysis design criteria, along with the program elements synthesized from case studies. This concept design of the community public pool for Forest Park intends to locate the amenities and facilities for the proposed site design and the relationship to each other, connectivity, and transitional spaces of the overall design. The concept design will culminate the following:

- Placement of lazy river to try to keep the river around the park. Have multiple entrances and exits (but not too many).
- Pathway functions, ease of access around the park, no dead-ends, various paths to get to places, wide routes near the front of the park where crowds are high and interconnect all areas of the pool.
- In kids' areas, provide an area for young kids to play in without being disturbed with family-friendly areas. Close to the central point of the pool park, but isolated from older-age attractions. Other considerations are short water slides, depth of water, and the ability of all ages to enjoy kids' areas and older kids' areas as well.
- Waterslides are the main waterpark attractions that ensure all ages are accommodated, safe, but exciting thrills that are unique.
- Place water slides to control crowds on the perimeter of the waterpark. Make sure people walk out of the ride and go back to the slide again.
- Concessions provide an assortment of foods and gifts. Ensure proper dressing rooms and easily accessible restrooms for guests using the waterpark. Provide Lost-and-Found points.
- Gifts, located at the entrance of the waterpark.
- Food – close to meeting areas and front gate with plenty of outdoor sitting areas.
- Security- at the front entrance of the waterpark to monitor incoming and outgoing guests.
- Restrooms at convenient areas located at the front gate, kiddie areas, exits of rides, and near eating areas

5.7 Schematic Master Plan Design

The schematic master plan design includes all considerations from literature review, case studies, program elements, site inventory, site analysis for the Forest Park new public pool design. The research led to the design of a recreational public city pool with program elements. These amenities are located

around a centralized circulation system with a primary focus on the leisure pools, beach entries, and kids' play feature areas.

Figure 5-11 Master Plan

Lap pool: For fitness, lap swimming, and water walking are essential to many adults and seniors. Opportunities for limited practice and training exist in a two, three, or four lane, 25-yard lap pool adjacent to a leisure pool. Additionally, programming can be incorporated for lessons and group activities. The lap pool is northeast of the water park.

Next, the lazy river is usually 6-8 feet wide, with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to enjoy the water leisurely. The lazy river is southeast of the waterpark, including multiple entrances and exits for pool users.

Waterslides are the waterpark's main attractions, and they provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water. Location is to be at perimeter of waterpark where crowds can be controlled.

The play features pool has interactive play features that bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. Chains and ropes can be manipulated and transformed by imagination. As children interact with these features, they control where and when the water sprays will occur. This is the central feature of the water park; therefore, is at the center of the park.

Leisure pools are 0 to 4-foot in-depth and provide adults and children with aquatic interaction, entertainment, relaxation, and fun. With an opportunity for many varied sizes and designs, the leisure pool is a desirable attraction for all ages and skill levels. Many additional amenities can be incorporated for added amusement.

This design includes two leisure pools connected with a channel of pool water. The west side pool with beach entry is for family entertainment and kids ages seven and up. The south side beach entry pool is for families and kids ages seven and below. There is a smaller pool area for more secure supervising of kids with parents. Both leisure pools have different play features with various individual features like water guns, tumble buckets, and car wash tunnels.

Beach entries or zero-depth entry simulates an ocean beach as the pool bottom slopes gradually toward the deeper water. Instead of jumping or climbing into the pool, patrons simply walk in as they would at a beach. Both leisure pools contain beach entries for kids' safety and family of all ages’ attractions.

Additions to the new water park are shade features, concessions, and dressing rooms. Shade umbrellas come in many styles and colors and provide necessary shade while lending a festive atmosphere. They cover, connect, and join areas while providing relaxation out of the

sun. Access to food, restrooms and dressing rooms are necessary for all user groups at any time of the day, along with a Help Security Center at the water park entrance to safely monitor incoming and outgoing guests. Additional recommendations from the literature review for the overall proposed park design are as follows, four site systems: a) Circulation, b) Buildings, c) Open Space, and d) Infrastructure.

3D Renderings:

The following 3D pool design consists of (1) Birds eye perspective view looking north to Forest Park Blvd.

Site View

Figure 5-12 Perspective

Lazy River Pool

The lazy river is lazy river is part of the leisure pool, usually 6-8 feet wide with water traveling at approximately three miles per hour. The current channel can provide an ideal floating adventure with a tranquil ride on a relaxing journey going with the flow, or it can be used for walking against the current as a non-programmed or programmed exercise. This amenity provides a refreshing way for all ages to leisurely enjoy the water.

Figure 5-13 Lazy River Pool

Lazy River View 1

Figure 5-14 Lazy River View 1

Figure 5-15 Lazy River View 2

Lap Pool

Essential to note that fitness lap swimming and water walking are important to many adults and seniors. Opportunities for limited practice and training exist in a two, three, or four lane 25-yard lap pool adjacent to

leisure pool. Additionally, programming can be incorporated for lessons and group activities.

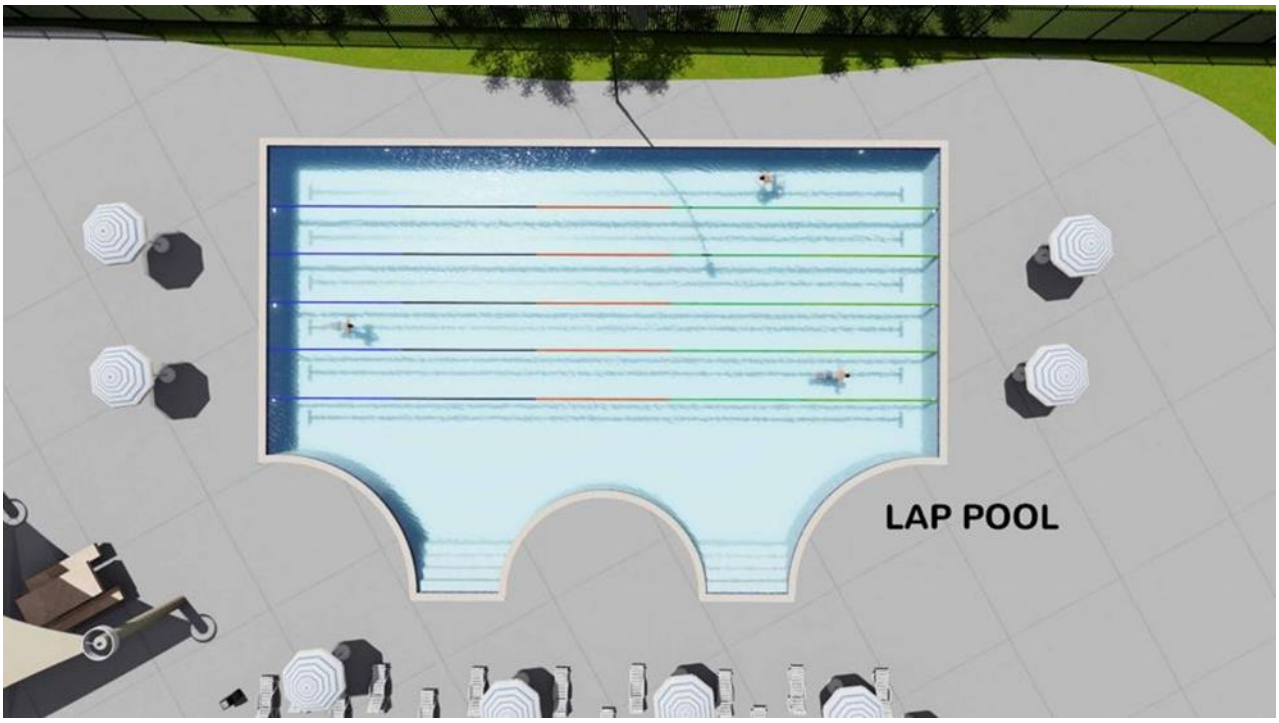

Figure 5-16 Lap Pool

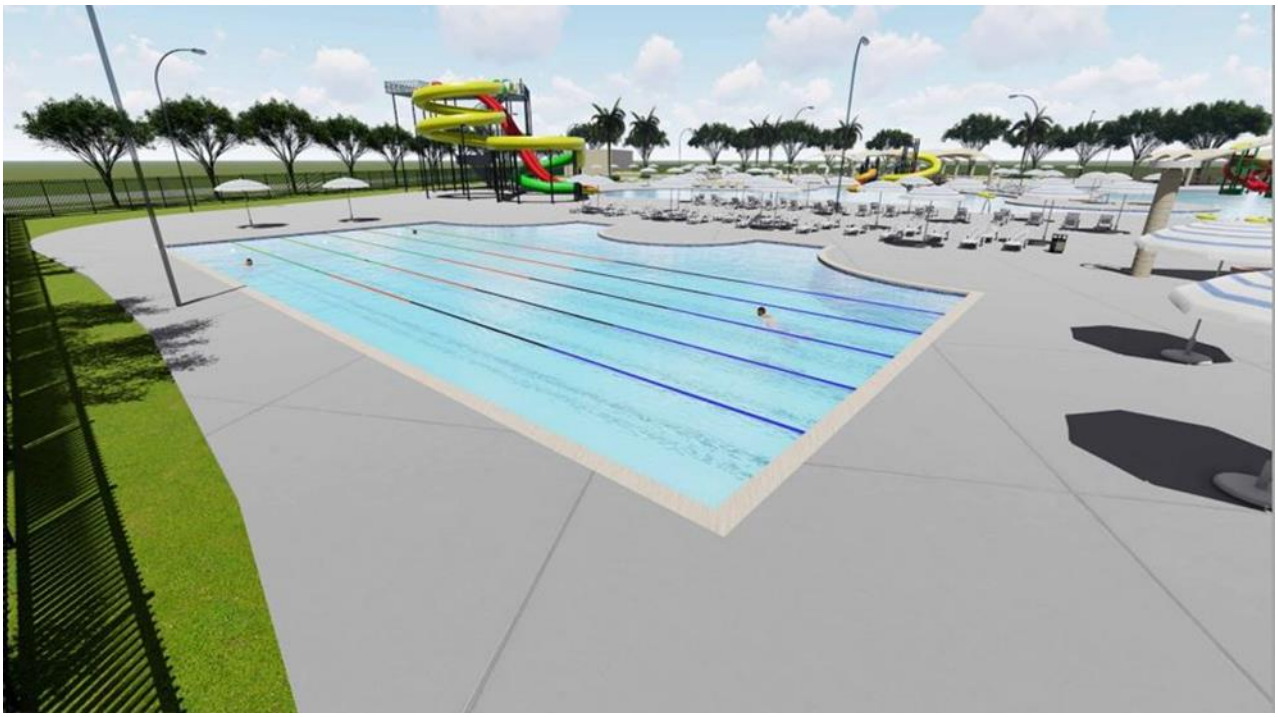

Figure 5-17 Lap Pool View 1

Play Features with Beach Entry at Smaller Leisure Pool

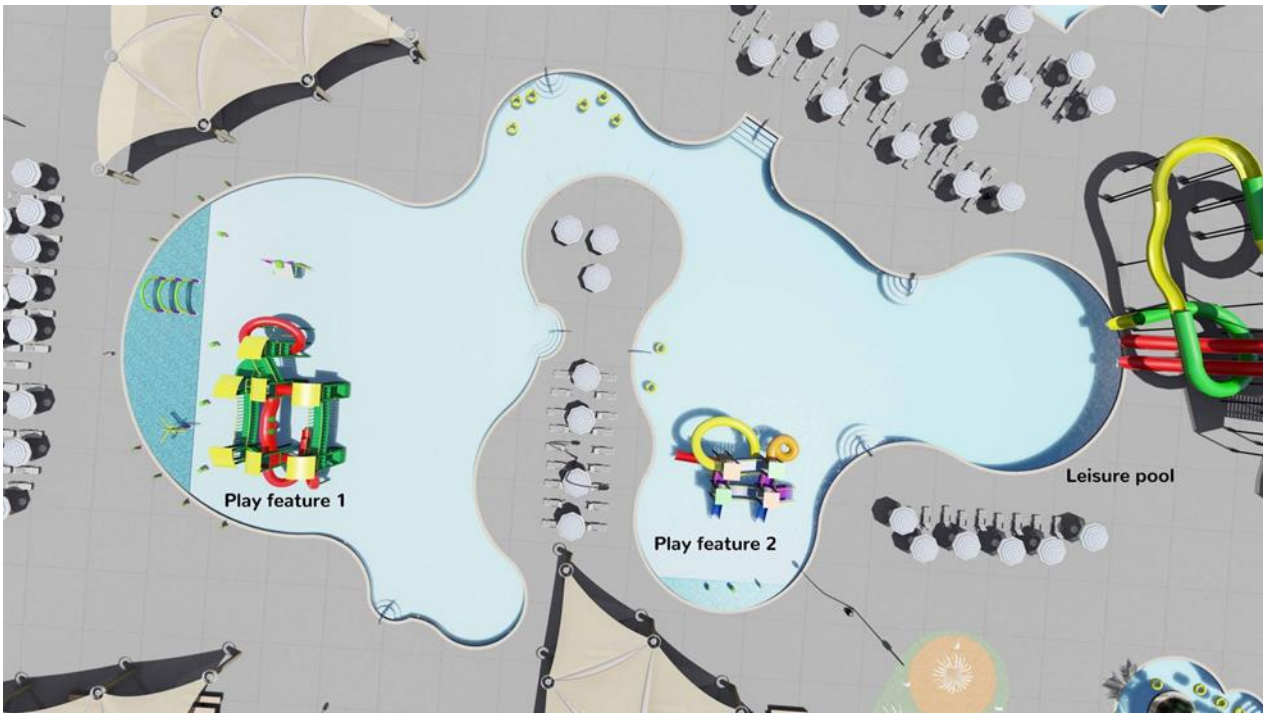

Figure 5-18 Main Leisure Pool

Figure 5-19 Play Feature View 1

Figure 5-20 Play Feature View 2

Figure 5-21 Play Feature View 3

Waterslides

Waterslides provide excellent recreation value and come in many shapes and sizes. The teen market is drawn to speed slides and drop slides. High-thrill swirl slides spin patrons around before shooting them down into the water.

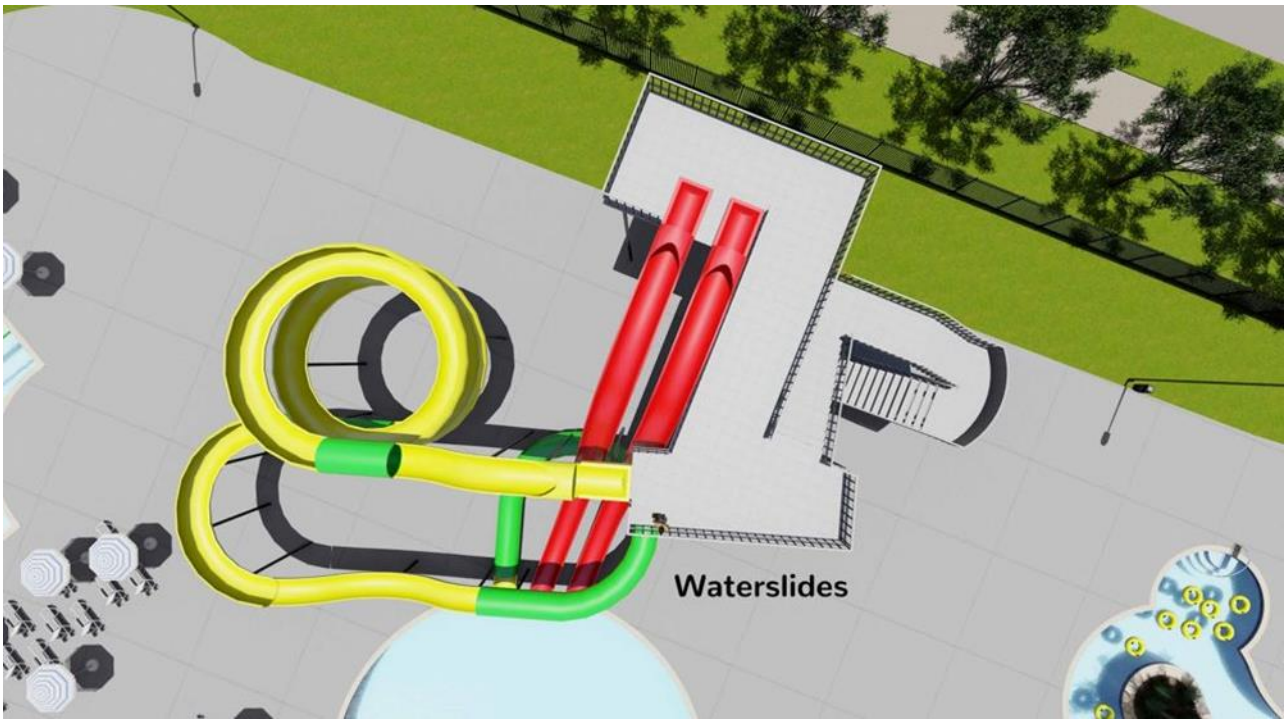

Figure 5-22 Waterslides View 1

Figure 5-23 Waterslides View 2

Play Features with Beach Entry at Main Leisure Pool

Interactive play features bring recreational value to aquatic facilities. Children can slide down slides, scamper through spraying water, climb across bridges, and scurry over and under tunnels. chains, and ropes can be manipulated and transformed by the imagination. As children interact with these features, they control where and when the water sprays will occur.

Figure 5-24 Main Pool Beach Entry

Figure 5-25 Shade Structure View 1

Figure 5-26 Shade Structure View 2

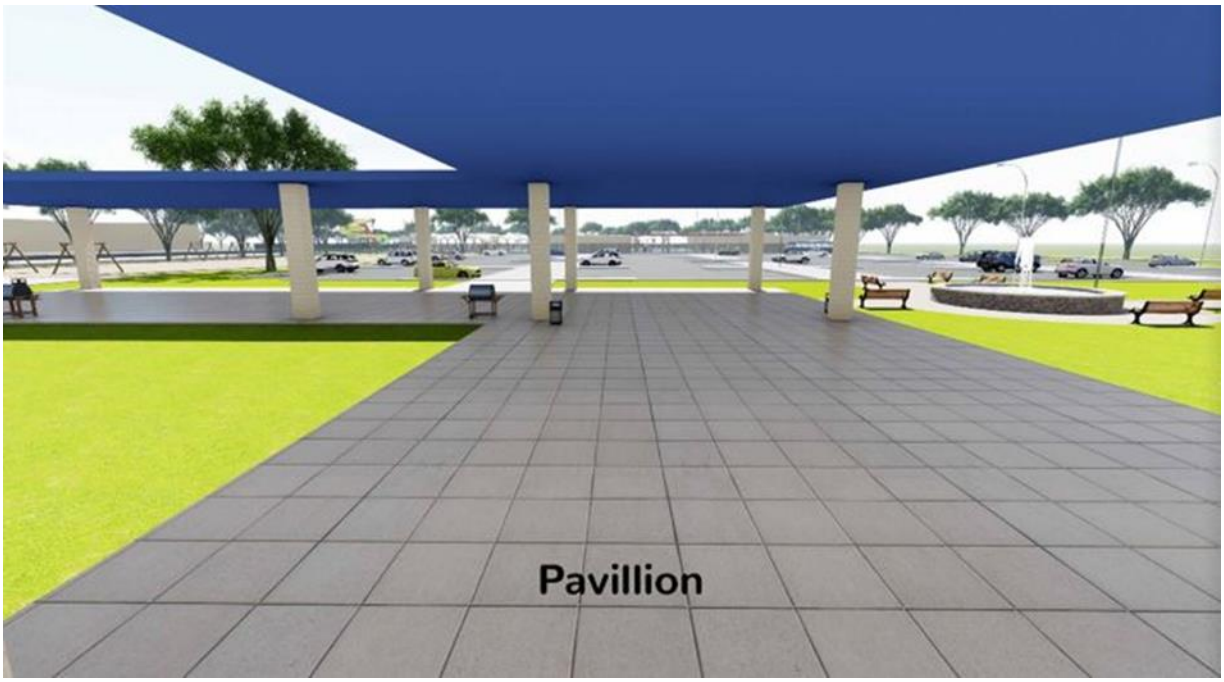

Figure 5-27 Pavilion

Figure 5-28 Main Pool Entrance

Figure 5-29 Concessions

Figure 5-30 Seating Area

Figure 5-31 Parking

5.8 Summary

This chapter provided the design for a new Forest Park public pool in Fort Worth, Texas. Culminated with the analysis, the findings, site analysis, and site inventory of the park, this study has provided the new public pool placing and orientation for best entry and access, parking locations, and pedestrian circulation within the site and inside the new swimming pool areas. The final public pool design for Forest Park includes: a lap pool, a lazy river, waterslides, play features, leisure pools, beach entries, shade features, concessions, dressing rooms, and restrooms.

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Chapter 6

Conclusion

6.1 Introduction

With fast population growth in Fort Worth and projections to increase the city's lack of outdoor public swimming pools, these facilities are significantly strained. Only two public pools remain in the entire city, with a current population of close to one million in 2021. The city has opted to fund other social amenities like community centers, golf courses, and trails. According to the study, the existing Forest Park Community Pool can be replaced by a successful and effective Class B recreational community public city swimming pool.

Recreational community city public pools are the most successful aquatic design for municipalities, with over 90% of aquatic users and provide 75% of net revenue (Aquatics Facility Study, City of Dallas, Texas, 2012)

. Incorporating fun recreational water features can meet users' current trends and needs by increasing yearly attendance. Encourage participation in learning-to-swim programs, making children want to learn to swim and have fun at the waterpark. It also will generate revenue to sustain operations expenses.

The following section briefly describes the questions raised at the beginning of the study, followed by the relevance to landscape architecture and future research. This study's purpose was to design a feasible community recreational public pool for the existing Forest Park Pool. The goal is to incorporate a successful and effective public recreational pool suitable for the south side of the Fort Worth, Texas community.

6.2 Research Questions Overview

The purpose of this Design thesis is to incorporate a new public pool design for the Forest Park in Fort Worth TX, what amenity pool criteria will this master design thesis produce?

This master design thesis will inform landscape architects, aquatic professionals, and park planners. Also, the study intends to suggest and recommend a new public pool design to enhance the city’s aging, community public pool parks.

What aquatic design approach, trend, and programming considered for the new Forest Park Pool design?

The pool design is for class B recreational public pool in south Fort Worth Texas. It incorporates fun features like playground equipment for children to play and interact with, waterslides suitable for multiple age groups from tots to teens and adults. Various water depths from zero-depth beach entries to plunge pools or diving areas; and other popular features for all age groups, such as lazy rivers and current channels. Additionally, modern recreational aquatic facilities include more comfort for extended stays, such as shade areas, lounge chairs, picnic tables, lockers, and concession areas.

What are the benefits of Landscape Architecture to the new Forest Park community recreational public pool?

Landscape architecture leads the overall site design with land, water, plant forms, and structures for their best and greater enjoyment. Landscape architecture includes the installation of features like pool fencing, lighting, decking, paving, furniture, safety, lifestyle, and functionality in the water park. Finally, landscape architecture prompts a relevance in enhancing the value of the aquatic parks and often has a high value in the market.

6.3 Relevance to Landscape Architecture

In most instances landscape architects lead the overall water park design, including the pool design but only to a schematic phase, and manage the park's construction. The architects make critical decisions to circulation like walkways and trails, building facilities, and infrastructure such as: outdoor lighting, seating, bike racks, safety fencing, gates, drinking water fountains, emergency telephones, safety pool equipment, furniture, and shade structures. Finally, open spaces of the park-like green open areas, vegetation spaces, nature spaces, conservation, and ecological areas.

When it comes to swimming pools and other bodies of water, for the general public's use, aquatic engineers are brought into the project. These engineers are the consultants to the landscape architect. They will make critical decisions on pool systems to locate essential infrastructure and materials for the structure. Finally, they will generate detailed construction drawings and seal drawings for approval of construction.

If you are interested, insert a sub-section called Discussion here and discuss critical issues and your opinions. (This is not required but an option).

6.4 Future Research

This thesis examined the obsolescence of public swimming pools in Fort Worth, TX and the need for more community recreational public pools to serve other parts of the city. This study led to the design of a recreational community public pool approach offering multiple medium-sized facilities, each with various bodies of water located throughout the community.

This research revealed other potential opportunities for outdoor public pools. One of those opportunities is splash pad feature to enhance the recreation value of a park or public swimming pool by featuring splash pads located on a concrete splash pad, either with or without standing water. Because of minimal water depth, splash pads can, in most districts, be operated without certified lifeguards, making them a cost-effective addition for all types of parks, recreation areas, and aquatic centers.

Another opportunity is regional aquatic centers. They offer a larger range of innovative amenities, deliver a unique customer experience, and draw from a more extensive regional radius. Finally, the other opportunity is a destination aquatic facility. These are mega water parks such as Wet & Wild and other theme parks around the country like Six Flags and Disneyland. Like any other potential public city, aquatic development opportunities in any city require suitability and feasibility studies. These studies are meticulously calculated and include detailed considerations dealing with city budgets and high-level city officials.

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