ABSTRACT

Title of Thesis:	A PLACE IN PUBLIC SPACE: DESIGNING AN AUTISM-FRIENDLY EXPERIENCE FOR ADULTS IN PALMER PARK
	Micaela Ada, Master of Landscape Architecture 2023
Thesis Directed By:	Dr. Naomi Sachs, Department of Plant Sciences & Landscape Architecture

In 2023, the CDC reported that approximately 1 in 36 children in the U.S. is diagnosed with autism spectrum disorder (ASD). Prevalence rates have nearly doubled every decade since the CDC began tracking this data in 2000. When these children come of age and enter adulthood, they face new milestones and challenges such as working, living away from the family home, and navigating the world with more autonomy. Design professions —including architecture, interior design, and landscape architecture— have progressively incorporated considerations for ASD into their spaces. Adult-specific, autism-friendly design guidelines existing today have honed in on improving workplace, home, and therapeutic environments. There is a noticeable gap in addressing landscapes made for the social and leisure aspects of life. To address this gap, this research design thesis focuses on implementing design interventions in Landover, MD's Palmer Park Community Center outdoors space to create an autism-friendly space for adults seeking comfortable recreation opportunities.

A PLACE IN PUBLIC SPACE: REDESIGNING RECREATIONAL OPEN SPACE FOR ADULTS WITH ASD

by

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Landscape
Architecture
2023

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Acknowledgements

First and foremost, I want to express my deepest gratitude to my advisor, Dr. Naomi Sachs, and to my committee members, Dr. Deni Ruggeri and Dr. Elizabeth Redcay, who supported me throughout this process. Your collective expertise, guidance, and encouragement were critical to the success of this work. I am grateful for this past year of learning and collaborating with you.

Thank you to the members of the UMD Autism Research Consortium, including Kathy Dow-Burger, Dr. Shevaun Lewis, and committee member, Dr. Elizabeth Redcay. Thanks to your investment in this project, I connected with wonderful people in the Autism Community which ultimately led to a successful focus group.

Thank you to the self-advocates who participated in the project focus group. Your insights were a cornerstone to this research and the greatest informant of the design.

Thank you to the parents and loved ones within the Autism Community who trusted me with their stories about the richness and realities of their experiences.

Thank you to landscape architecture professionals, Virginia Burt and Maci Nelson, who helped me develop my understanding of the connection between landscape design decisions and the experiences of people with autism spectrum disorder.

Thank you to the team at MNCPPC for supporting the progress and traction of this thesis project.

Thank you to my MLA cohort for being the ultimate cheerleaders no matter the hour. I'm eternally grateful for our little community of support and love. I'm glad we were here together.

Thank you to my family and friends for their unwavering encouragement. A special thank you to my friend, Kim, for inspiring this work and acting as my north arrow throughout the entirety of this project. If I could hand out an honorary MLA, it would be to you.

Finally, thank you to the University of Maryland Department of Plant Sciences and Landscape Architecture faculty, lecturers, and staff for ushering me through this academic journey. Thank you for putting in the, at times unseen and unacknowledged, work to help landscape architecture students successfully build a foundation to become the next generation of designers.

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Chapter 1: Introduction

The purpose of this thesis project is to create an autism-friendly recreational space for adults that is rooted in evidence-based design, as well as established universal and ASD-specific principles from other design professions. For all people, navigating the everyday experience consists of a near constant intake of interactions at a range of scales. Whether it be with objects, the environment, or other people, humans are continuously processing stimuli. Oftentimes, the 'neurotypical' person, or a "person not affected by a developmental disorder " (Miriam-Webster, 2023), processes stimuli and social interactions without a second thought. For people with autism spectrum disorder (ASD), processing even the considerably quotidian occurrences and environments is impacted by their neurological conditions. ASD is characterized by a range of conditions including challenges with social skills; hyper- or hypo-sensitivity to stimuli; and atypical speech and nonverbal communication (Autism Speaks, 2021). With variability (spectrum) in the name, it is unsurprising that ASD is experienced on a spectrum of severity. Each individual diagnosed will have their own unique combination of strengths and challenges when moving about the world. This study explores how people on the spectrum experience public space, and identifies ways in which design professionals have digested and incorporated this knowledge into their work on the physical environment. Landscape architecture, being one of these professions, continues to expand the body of research surrounding ASD and environmental design. Through projects from playscapes to therapeutic gardens to community gardens, landscape architects (LAs) have created healthier, welcoming spaces for people on the spectrum. That being said, there is a noticeable

gap when it comes to landscapes that push for autism-friendly considerations in public parks and open space. A similar discrepancy is seen regarding design guidelines that center around adults with ASD. This thesis contributes to the strong collection of existing projects by addressing these gaps and designing for landscapes that are not explicitly designed to be therapeutic or productive –an everyday landscape. Guiding questions in this endeavor ask:

RQ1: In what ways can a recreational landscape be designed to accommodate adults with autism spectrum disorder, providing these users with a comfortable and equitable experience?

RQ2: What design guidelines exist today for people with autism spectrum disorder?

RQ3: Are they translatable to landscape architecture?

Chapter 2: Literature Review

What is Autism Spectrum Disorder (ASD)?

ASD is a complex and lifelong neurological condition that impacts the ways individuals interact with other people and the world around them. According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V), the American Psychiatric Association's taxonomic and diagnostic tool, ASD is characterized by challenges in social communication and interaction coupled with a variation of "restricted and repetitive patterns" of behavior and interests (Masi, et al., 2017; American Psychiatric Association, 2013). Additionally, individuals with ASD possess varying degrees of cognitive skills that influence their abilities in sensory processing; motor skill execution; and goal-oriented and reflexive thinking, planning, and self-regulation (Robertson, 2010).

Ways That People With ASD May Experience the World Differently ASD

As a spectrum condition, ASD presents differently for each individual. Famously said by Dr. Stephen M. Shore, "if you have met one person with autism, you have met one person with autism." One person may have difficulties with social relationships while another person may be quite sociable. One person may have impressive intellectual ability while another may have challenges associated with learning disabilities. Broadly speaking, people with ASD may experience varying degrees of *hypo- or hyper sensory processing, executive dysfunction*, and *communication differences*.

Hypo- or Hyper-sensory Processing

Figure 1. The 7 Senses. (Source: 7senses.org.au)

Hypo- or hyper-sensory processing refers to challenges with receiving and responding to sensory messages (McArthur, 2022). Processing challenges may occur in any of the seven senses (*Figure* 1). It can be experienced in extreme sensory conditions, such as urban traffic sounds, as well as everyday sensory conditions, such as the way clothing material or grass feels on the skin. To illustrate, on an urban street, while a neurotypical person may be able to tune out the sounds of the cars, laughing children, the click of high heels, or the steam coming from grates, an individual with autism could be experiencing every one of those stimuli at full volume at the same time. Or in the moment, an individual may need to feel sensory input, and they may soothe this through movement or stimulating one of the senses. In situations where an individual feels overloaded and is unable to remove themselves from the stressor, they may experience a stress response called meltdown. Meltdowns are an involuntary, at times explosive, physical and emotional release to quell stress

overload (Bedrossian, 2015). As Dr. Wenn Lawson, autistic researcher and advocate, described it:

> "Most people take the routines of life and day-to-day connections for granted. The fact that they can see, hear, smell, touch, and relate to others is "normal". For me, these things are often painfully overwhelming, non-existent, or just confusing (Lawson, 2001)."

Executive Dysfunction

Executive dysfunction is the set of cognitive processes, involving working memory, inhibitory control, flexibility, planning, and attentional control, that enable a person to manage goal-directed behavior (Cristofori, Cohen-Zimerman, & Grafman, 2019; Gilbert & Burgess, 2008). People with ASD may have trouble with these skills, manifesting in an "insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior" (American Psychiatric Association, 2013). In other words, an autistic individual may find sudden changes to a routine, transitioning from one activity to another, and approaching and reacting to unfamiliar circumstances challenging.

Communication Differences

Autistic individuals communicate in myriad ways. In some cases they may be non- or minimally verbal. Some individuals use Augmentative or Alternative communication devices such as pictures or speech generating devices, or sign language. Essentially, spoken language may not be the ideal mode for people.

Although relative strengths and challenges are specific to the individual, there are some commonalities. For instance, many autistic people have key strengths that include detailed thinking, expansive long-term memories, a comfort with rules and guidelines, and an affinity for analyzing complex patterns in the social and physical worlds. Likewise, many autistic people have key difficulties in managing several simultaneous tasks, understanding social nuances, filtering competing sensory stimuli, and planning tasks of daily living (Robertson, 2010). That said, there exists no cookie-cutter accommodations for the autistic population. The condition's heterogenous nature requires heterogenous accommodations.

Is ASD on the Rise?

Since the Centers for Disease Control and Prevention (CDC) began tracking ASD prevalence in 2000, the rate of diagnosis has doubled approximately every decade in the United States In 2000, 1 in 150 children in the US were identified with ASD. Today, that statistic is 1 in 36 children (Center for Disease Control, 2023). At face-value it seems as though instances of ASD are increasing, however this change in prevalence rate is attributed to a combination of factors including growing awareness of ASD, more comprehensive diagnosis criteria, and increased access to diagnostic healthcare services in marginalized communities (Rice, et al., 2012). Rather, this statistic reveals that ASD is common.

Diagnostic Levels of ASD

ASD symptoms are often recognized in childhood and persist throughout the lifespan. Today, ASD can be diagnosed as early as 18 months old, with the average age of

ASD Levels	Social Communication	Restricted, Repetitive Behaviors
Level 1: Requiring Support	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches	Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.
Level 2: Requiring Substantial Support	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and how has markedly odd nonverbal communication.	Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
Level 3: Requiring Very Substantial Support	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful response to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to- and-for conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.	Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

Figure 2. Levels of Autism Spectrum Disorder Diagnosis. Source: (Autism Speaks, 2013)

diagnosis being 5 years old (Elder, et al., 2017; van't Hof, et al. 2021). An individual is diagnosed with one of three levels of ASD. Level is dependent on how much support an individual requires, with Level 1 designating "Requiring Support" and Level 3 designating "Requiring Very Substantial Support" (*Figure* 1).

ASD in Adulthood

Individuals with Disabilities Education Act

In the US, autistic youth and their families may utilize federally mandated services through the Individuals with Disabilities Education Act (IDEA) (Anderson & Butt, 2018). IDEA is an education-focused law that makes available a free appropriate public education to eligible children with disabilities and ensures special education and related services to meet the unique needs of these children. In addition, IDEA services and programs aim to prepare children for continued education, employment, and independent living. IDEA Part B states that youth ages 5 through 21 are eligible to receive supports including therapeutic services, health-related services, personal counseling, access/ mobility services, personal assistance, and case management (Individuals with Disabilities Education Act, 2004; Anderson & Butt, 2018; Roux, et al., 2015). After age 21, autistic individuals and their families must navigate the transition to arranging their own adult-appropriate services (Ghanouni, et al., 2021). That age-out period from these services is commonly referred to as the 'services cliff' in the autism community. Recall that the CDC began tracking ASD prevalence in 2000 – the children who were diagnosed in that first year are now at least 22 years old and have reached the 'services cliff'.

Quality of Life

ASD, to reiterate, is a lifelong condition which necessitates long-term support services. A majority of adults with ASD need and benefit from support services that assist with socialization and independent living (Turcotte, 2016; Bishop-Fitspatrick, Minshew, & Eack, 2013). As children with ASD transition into adulthood, they and their support circles must navigate new challenges –one dominant concern being quality of life (Gaines, et al., 2016; Ghanouni,et al., 2021). For the general population, quality of life in adulthood is heavily influenced by self-determination, social inclusion and relationships, personal well-being, and personal development and autonomy (Robertson, 2010). Good quality of life creates potential for positive outcomes in employment, social engagement, and independent living (Bishop-Fitzpatrick, et al., 2016). For adults with ASD, these factors are frequently challenged by external circumstances including lack of awareness about the needs of people with ASD, and fewer opportunities and environments that accommodate ASD-related needs (Gaines, et al., 2016; Graetz, 2010; Ratto & Mesibov, 2015).

Adults with ASD are shown to experience disparities in health outcomes including higher rates of cardiovascular problems and mental health conditions (Bishop-Fitzpatrick & Kind, 2017). In fact, past prevalence rates indicate that between 73-81% of adults with ASD experience at least one co-occurring psychiatric disorder (*Figure.* 3) including anxiety disorders, mood disorders, attention deficit hyperactivity disorder (ADHD), depression, obsessive-compulsive disorder (OCD), and oppositional defiant disorder (Mosner, et al., 2019). Adults with ASD experience

these psychiatric conditions at a higher prevalence compared to the general population (*Figure.* 4) (Croen, et al., 2015).

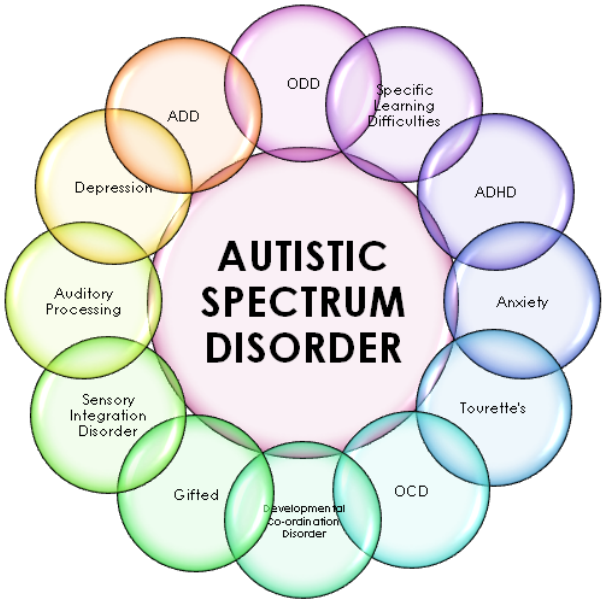

Figure 3. Commonly co-occurring conditions experienced with ASD. Source: (Neurofeedback Integrated Therapy Institute)

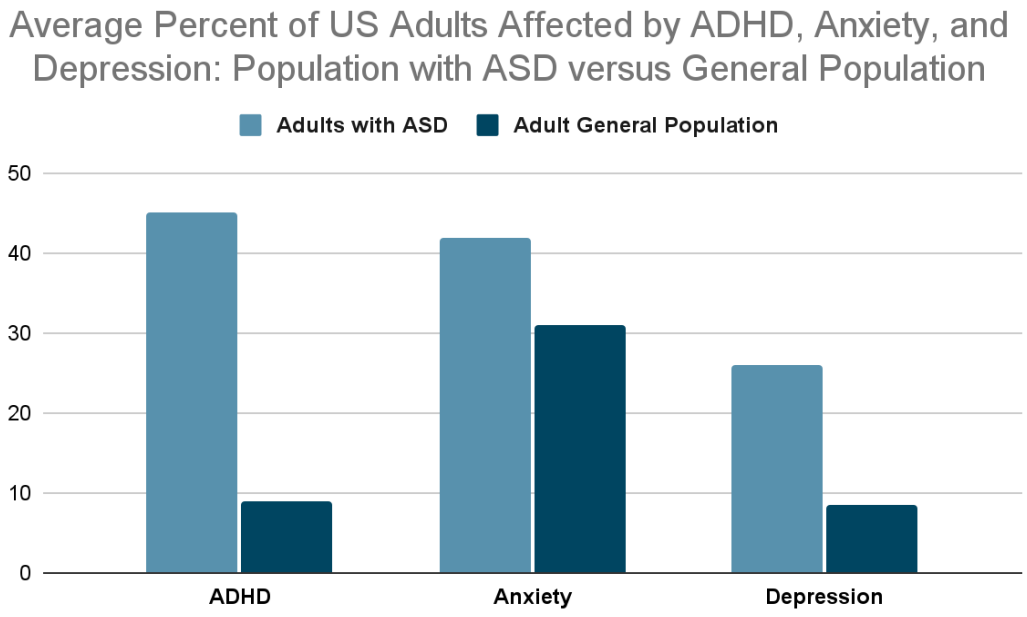

Figure 4. Average Percent of Adults Affected by ADHD, Anxiety, and Depression: Population with ASD versus General Population. Source: (Autism Speaks)

Well-being Benefits of Nature

It is widely known that time spent in and near natural environments has positive associations with mental and physical health for adults (Capaldi, et al., 2015). People in areas with more green space have displayed physiological markers of health including lower blood pressure and cortisol levels (Twohig-Bennett & Jones, 2018). In addition, increased nature engagement is associated with increased physical activity and lower risk of cardiovascular disease for adults (Jimenez et al., 2021). In their study of 305 adults, Martyn and Brymer (2016) found an inverse link between self-reported measures of connection to nature and anxiety. Participants reported experiencing relaxation, enjoyment, and sensory engagement as they spent time in and connected with nature.

Outdoor environments are found to encourage social cohesion and integration as well. Outdoor environments serve as a platform for socialization through non-competitive and competitive recreational experiences and may help bring people out of isolation (Colombo-Dougovito, et al., 2021; Wakefield, et al., 2007). Within these experiences, one may find opportunities for intercultural communication, sharing experiences, and building understanding, all of which help individuals create stronger connections to their local community and living environment (Leikkilä, et al., 2013). Even simply being near nature has also shown potential to buffer some negative impacts related to lack of social connectedness (Cartwright et al., 2018).

Contextualized, with the co-occurring psychiatric disorders, health outcomes, and concerns about social inclusion in adulthood, accessible opportunities for nature

engagement has the potential to promote positive impacts in the health and well-being of autistic adults.

Theoretical Frameworks and Underpinnings

It is worth noting that the aforementioned health benefits of and positive affect associated with nature are grounded in three key, long-standing theories in the landscape architecture field: the stress reduction theory (SRT), the attention restoration theory (ART), and the biophilia hypothesis.

Stress Reduction Theory

Robert Ulrich's Stress Reduction Theory (SRT) proposes that natural environments promote recovery from stress. This effect is linked to activation of the parasympathetic nervous system (PNS) in the presence of natural elements and unthreatening natural environments. The PNS is responsible for initiating the 'rest and digest' physiological response when the body needs to conserve energy or relax after a stress event (Ulrich, 1981; Ulrich, et al., 1991).

Attention Restoration Theory

Kaplan and Kaplan's Attention Restoration Theory (ART) suggests a link between time spent in nature and cognitive performance. The theory suggests that there are two types of attention: directed or voluntary attention, and involuntary attention or 'soft fascination'. Directed attention is utilized during tasks that require intentional and prolonged attention. Overexertion of directed attention can lead to increased levels of mental fatigue and reduced cognitive performance. Nature can effortlessly hold the passive form of human attention, the 'soft fascination'. When the mind is occupied with this involuntary form of attention, it enables one's directed or

voluntary attention to rest, thus allowing the mind to renew attention (Kaplan & Kaplan, 1989).

Biophilia Hypothesis

E.O. Wilson's Biophilia Hypothesis posits that human beings, having evolved in natural environments, positively and emotionally react to elements in nature associated with survival. Which may explain why sensory stimuli such as the sight of lush vegetation, the sound of grasses and animals, and the smell and sight of water evoke calm and relaxation (Kellert & Wilson, 1993).

Addressing Autism in the Design World

Until the early 1990s, only three U.S. states developed widespread barrier-free codes, with sensitivity toward people who were disabled. The Americans with Disabilities Act (ADA) was instrumental in this movement. When it became a civil rights law in 1990, guidelines were written that helped to direct designers and architects in developing spaces accessible for people with physical disabilities (Sánchez, Vázquez, & Serrano, 2011). The ADA also makes it unlawful to discriminate against a person based on that person's association with a person with a disability.

In 2010, the Department of Justice revised the ADA, in doing so, adopted enforceable accessibility standards titled the 2010 ADA Standards for Accessible Design. The Standards are landmark in creating more equitable spaces for people with physical disabilities and impairments, and set the baseline for continued work in creating inclusive spaces.

Universal Design

In 1997, a working group from North Carolina State University led by Robert Mace, developed The 7 Principles of Universal Design. The purpose of the principles is to guide designers across different fields to create products and environments that are usable to the greatest extent by all people regardless of age, ability, or other factors (Center for Universal Design, 1997; *What is Universal Design?*). The American Society of Landscape Architects (ASLA) expanded on these principles in 2019, publishing the "Guide to Universal Design" for landscape architecture and public realm professionals (*Figure.* 5). The guide provides a comprehensive view of the communities underserved by the built environment. Beyond highlighting people who experience disabilities and aging, the guide uniquely addresses people with limited mobility, lack of community access, neurocognitive disorders, neurodevelopmental and/ or intellectual disabilities, blindness and low vision, and deafness and hardness of hearing (*ASLA Publishes Guide to Universal Design,* 2020; Dillon & Green*,* 2019).

7 Principles of Universal Design	**ASLA Universal Design Principles**
Equitable in Use	Accessible
Flexible in Use	Comfortable
Simple and Intuitive in Use	Participatory
Perceptible Information	Ecological
Tolerance for Error	Legible
Low Physical Effort	Multi-Sensory
Side and Shape for Approach and Use	Predictable
	Walkable/Traversable

Figure 5. Original 7 Principles of Universal Design and the expanded Principles Developed by the American Society of Landscape Architecture. Source: Center for Universal Design, 1997; ASLA Publishes Guide to Universal Design, 2020

Medical vs Social Model of Disability

While design for autism is relatively new in the grand history of design, it is not completely novel. In the disability community, there are two prominent models of disability: the medical and social models (*Figure.* 6). The medical model of disability (all disability, not just ASD), often considered the standard view, reduces disability to only existing within a person's body, viewing a person's disability as a defect or something to be cured. In contrast, the social model views disability as a neutral difference, and puts more emphasis on the ways external factors limit people with disabilities such as social attitudes and the physical environment (Shakespeare, 2006). The social model first emerged in the 1980's and has been a challenge to built environment designers for better design.

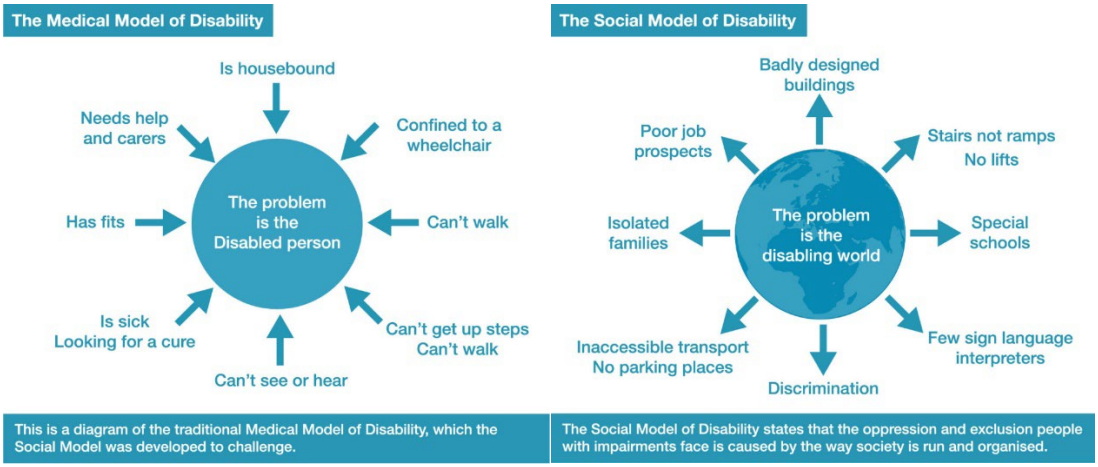

Figure 6. Medical vs. Social Models of Disability. Source: Inclusion London, 2022

Existing Design Guidelines and Frameworks

Design guidelines and frameworks for ASD-friendly environments have developed from various built environment professions. The following section reviews and compares guidelines for garden design, architecture, interior design, and urban planning to see if commonalities exist across scales and scenarios. The review will

also note guidelines within the aforementioned environments that may be applicable to public park spaces.

Outdoor Environments for Adults with Autism

The following design guidelines for outdoor environments for adults with ASD (Gaudion & McGinley, 2012) are part of a larger research-based design project at the Kingwood College in Reading, England. Kingwood College is a residential and training facility that provides educational programs and life skill training for adults on the autism spectrum between age 18 through 25. Their mission is to support young people through the transition to independent living and work. Katie Gaudion and Chris McGinley partnered with the facility to conduct a participatory study to develop a co-designed garden (*Figure.* 7), using input from the current cohort and staff. Mindful of the social, physical, and mental health benefits of time spent in outdoor spaces, this garden was to provide opportunities for environmental learning and improved quality of life for the students at Kingwood College.

Figure 7. Kingwood College garden concept design illustrative. Source: (Gaudion, & McGinley, 2012)

The study began by first distilling down design themes of the ways adults with autism experience a garden space. The key themes established were ‘Triggers’,

'Growth', and 'Support'. 'Robustness' rounded out the themes to address functionality, maintenance, and safety considerations (*Figure.* 8).

'Triggers' address external factors in the environment that may overwhelm an individual or cause acute anxiety. By nature, outdoor environments have characteristics that are unpredictable and spontaneous. Stimuli hypo- and hyper-sensitivities are commonly experienced by people with ASD. The sensory perceptual experience must be considered in design. Recommendations in this garden is to incorporate predictability, logic, and organization wherever possible. This applies to layout of spaces, transitions between spaces, and clear, multi-modal wayfinding. There should be dedicated spaces for sensory respite and sensory stimulation.

Figure 8. Principle design themes established in preliminary research for Kingwood College garden. Source: (Gaudion, & McGinley, 2012)

'Growth' addresses the garden's potential to help individuals develop skills used in the larger community by participating in occupational, leisure, and exercise activities. This theme relates most to site programming. It encourages opportunities for people to exercise decision-making, practical, and communication skills through group or solo activities. An exercise activity could be jumping on a trampoline to

improve strength and coordination. An occupational activity could be a growing garden to teach cultivation and encourage a sense of ownership.

'Support', in this context, addresses the necessity of site features that foster meaningful interactions between the autistic individuals and the Kingwood College support staff. The garden should provide an open invitation for everyone to participate. Spaces for one-on-one and small group activities are encouraged. In addition, permeable views to different spaces are important to respect those who want a secluded moment while also allowing staff to check-in from afar.

'Robustness' addresses the durability of the garden. People with ASD may have challenges with their sense of space and body positioning, which can result in unexpected movements, injury, and undue physical force on objects. Choosing durable furniture, materials, and planting is critical to accommodate varying vestibular and proprioceptive abilities. Industrial-style furniture and materials should be avoided as this may look hostile. It is also important to note that robustness does not mean rigidity –spaces should have degrees of flexibility to react to changing needs and interests.

Magda Mostaf's ASPECTSS Design Index

Magda Mostafa, an associate professor of Design in the Architecture Department at The American University in Cairo, authored the first research-based design framework for autism titled the ASPECTSS Design Index (Mostafa, 2014). ASPECTSS is informed by Mostafa's previous research that surveyed teachers, parents, and primary caregivers of children with ASD to determine what classroom environment qualities the stakeholders prioritized when thinking about usability. The

study observed a control group and study group in two design intervention classrooms using attention span, response time, and behavioral temperament indicators (Mostafa, 2008). Mostafa summarizes,

> "...this study proposed that to design a built environment for autism one must calm it down, break it down into manageable experiences in discrete spaces, organize those spaces in a sensory and temporally logical flow and accommodate for sensory overload escape (Mostafa, 2014, p. 58)."

The seven design criteria that make up the index are acoustics, spatial sequencing, escape space, compartmentalization, transition spaces, sensory zoning, and safety. They are summarized as follows:

'Acoustics' addresses sensory input related to noise exposure. Noise management in an architectural context can be achieved through sound absorbing materials, echo-reductive spatial configuration, and avoidance of sound-emitting fixtures such as fluorescent lighting. This should be balanced with the presence of background noise in some spaces to allow people to self-manage and the choice of noise level.

'Compartmentalization' addresses challenges with task management and self-regulation in response to environmental stimuli by suggesting that spaces are organized into mono-functional areas. Organizing spaces by function reduces sensory and social input, helping the user concentrate on tasks they want to carry out in the dedicated space. 'Compartments' can be designated from complete enclosure using walls and partitions to suggested enclosure using a change in material or color schemes.

‘Escape Space’ addresses commonly experienced sensory overstimulation, suggesting the necessity of a defined space that is sensory neutral and easily accessible. This space would provide respite if users feel overwhelmed by the physical and social environments. Escape spaces should be intimate in scale and enclosed in some way. As with the aforementioned compartmentalized spaces, this enclosure can range from complete to suggested.

‘Transition Spaces’ addresses challenges some people with ASD experience in response to abrupt shifts in function and stimulation. The criteria suggests allowing areas between two different sensory levels or activity types. Placing liminal spaces between activity zones provides a moment for the user to prepare and aids a smoother experience.

‘Sensory Zoning’ addresses considerations for grouping spaces by sensory levels and qualities. This means organizing spaces into high, moderate, and low stimulation zones depending on where they best fit. This should be coupled with the transition space design principle

‘Spatial Sequencing’, another layer of organization to coincide with sensory zoning, suggests organizing spaces in alignment with the routine or schedule of its users. This would be another way of providing a smooth transition from one functional space to the next.

Vogel’s 8 Design Standards

Vogel’s 8 Design Standards (Vogel, 2008) are classroom design guidelines for early learning environments. These standards were developed through interviews with autism parents, teachers, therapists, and college students and adults with ASD. While

originally intended for learning environments, these are certainly applicable to other interior spaces. The standards are as follows:

'Flexible and Adaptability' – This means that an environment should be able to transform on a moment's notice. Through the use of furnishing and partitions, a flexible and adaptable room can be divided into smaller spaces for group or individual work.

'Non-Threatening' – Non-threatening environments should feel welcoming and foster social encounters and relationships amongst the students. Under this standard, there should be places where one may find rest and secure respite. A few examples that Vogel gives are high perching spots such as balconies or low, enclosed spaces such as tunnels or a cozy nook. Materiality can be used to create non-threatening environments as well. Using soft elements or furnishing that can provide sensory input.

'Non-Distracting' – This standard refers to reducing the potential for sensory overload by ensuring that a room is 'decluttered' from unnecessary stimuli. As previously mentioned, it can be hard for people with ASD to filter sensory messages in their surroundings. Cleaning a space of distracting elements can provide a calming environment.

'Predictable' - Predictability through consistency and visual cues helps people with ASD better understand and organize themselves within their environment. Vogel gives examples at the school campus scale such as clearly delineated pathways, creating districts with visual identities, and placing landmarks like sculptural elements. Signage and sightlines are also valuable tools for predictability.

‘Controllable’ – Controllable environments offer opportunities for choice. An autistic individual’s sensory processing or social challenges can give rise to discomfort and anxiety in an environment. If provided with transition spaces or areas away from anxiety-inducing environments, someone with ASD may feel a greater sense of control over how much environmental exposure they opt to have.

‘Sensory-Motor Attuned’ – Environments should have a necessary preparations for fluctuations in sensory needs. Sensory needs will look different from person-to-person or even day-to-day in the same person. A perfect sensory environment does not exist, however preparation for a diverse set of needs is ideal.

‘Safe’ – This applies to physical hazards in a room as well as hazards to emotional security. Toxic plants, loose surfacing materials, and exposed hazards such as wiring should be avoided. Durable materials should be considered for furnishings, structures, and high traffic areas as people with ASD are prone to ‘stimming’ behaviors and they may hurt themselves in the process if there are breakable elements nearby. Transparency in windows and doorways help ease transitions and encourage feelings of security. Finally, small, digestible spaces are found to enhance feelings of closeness and safety. It is helpful to have places away sized to an intimate scale.

‘Non-institutional’ – Finally, it is incredibly important to avoid institutional aesthetics. Warm and welcoming environments that are home-like create more positive experiences in a space. Using softer light, soft furnishings, plants and other objects found in nature form a relaxed environment and thus, in a classroom environment in this case, students can retain more information.

Though Vogel's target population and environment is a significant departure from that of this thesis project, the standards are translatable to landscape elements such as environment scale, furnishings, sensory provisions, and tools for predictability.

Six Feelings Framework

This planning and design strategy is the culmination of research performed by the Knowlton School of Architecture in partnership with the non-profit organization, Autism Living. The framework responds to the need for built environment improvements to create a more inclusive public realm for adults with ASD. Understanding the emotional stress and cognitive challenges experienced in the public environment, these guidelines are uniquely framed through the perspective of feelings. Overall, the goal of this framework is "to create environments where adults with autism can thrive (Autism planning and design guidelines 1.0, 2018, p. 5)." The framework (*Figure.* 9) advocates that planning and design interventions in the public realm should make autistic adults feel connected, free, clear, private, safe, and calm.

1. ***Feel connected*** - because they are easily reached, entered, and/or lead to destinations.
2. ***Feel free*** - because they offer relative autonomy and the desired spectrum of independence.
3. ***Feel clear*** - because they make sense and do not confuse.
4. ***Feel private*** - because they offer boundaries and provides retreat.
5. ***Feel safe*** - because they diminish the risk of being injured.
6. ***Feel calm*** - because they mitigate physical sensory issues associated with autism.

Figure 9. The Six Feelings Framework (Source: Autism planning and design guidelines 1.0, 2018)

Along with common infrastructure, the guide highlights design interventions in seven contexts: downtown, urban, suburban, multi-modal hub, retail, campus, and park access. For this thesis, common infrastructure and park access are the most applicable (*Figure.* 10).

Design Intervention	**Recommendation**	**Research Support**
Sidewalks	8'-0" minimum sidewalk 2'-0" minimum barrier between pedestrian and vehicular lanes	Sidewalk width and proximity to vehicular movement influence feelings of overcrowding when using a walkway. 8'-0" accommodates three people walking comfortably side-by-side. This width is recommended to reduce feelings of overcrowding and sensory overload. In addition, 2'-0" minimum barriers are recommended between pedestrian infrastructure and roads to reduce stimulation caused by nearby cars as well as provide added safety as this population often experience diverse sets of motor impairments.
Crosswalks	10'-0" minimum width Magenta paint for crosswalk Assistive wayfinding on pavement Visual and auditory crosswalk navigation indicators	Crossing streets can be stressful. Using multiple communication indicators, utilizing a proven comforting color for ASD, and widening the crosswalks can offer clarity, comfort, and feelings of safety
Bus Stops	Shelter dimensions of minimum 8'-0" wide and maximum depth of between 6'-0" and 12'-0" Interactive digital help and route display boards Functions on display that indicate a passenger is waiting on a particular bus line	Humane bus stop design provide comfort and safety, reducing confusion and anxiety associated with public transportation
Lights	Light fixtures outfitted with LED or incandescent light	Flashing, flickering, or excessively bright light impacts

	bulbs that are low-noise, low-glare, light yellow color	the well-being of many people with ASD. Utilizing LED or incandescent bulbs eliminate the flickering or buzzing that may occur with fluorescent lights. Colors that are found to be calming are purple, blue, or yellow.
Parking Lots	Sidewalks to connect parking spots to destinations Speed bumps and signs for yielding or stopping for pedestrian safety 24'-0" lane between parking spot lines Wayfinding that includes visual directions on the sidewalk to parking sections	Parking and dropping off passengers in parks can be challenging for adults with autism. Parking lots can be challenging to navigate if there is limited space and the areas where cars will be driving and where it is safe to walk are unclear.
Wayfinding	Directional symbols, place names, destinations, landmarks, and instructional print on all types of infrastructure indicating what is upcoming (roads, bike lanes, bus stops) Vertical signage in combination with wayfinding on the ground plane	Navigation, especially in busy or unfamiliar areas, can cause overwhelm for adults with ASD. A clear wayfinding system on the sidewalks providing clear directions is desired
Streets	10'-0" maximum drive lanes 5'-0" minimum bike lanes 3'-0" minimum landscape buffer to separate bike lanes from the street (Soft) glow-in-the-dark green paint surfacing for bike lanes Sidewalk recommendations apply	Independence in travel is an expressed concern. Navigable, safe, accessible infrastructure around parks is desired. Multi-modal roads with separated zones for each traveler type increase accessibility and safety for all users, particularly for non-car users. Narrower lanes typically lead to slower travel speeds.

Figure 10. Selections of The Six Feelings Framework Design Recommendations. Source: Autism planning and design guidelines 1.0, 2018.

Cross-referencing these design guidelines for garden design, architecture, interior design, and urban planning, some key themes emerged (*Figure.* 11). All guidelines emphasized sensory quality, accounting needs for higher and lower stimulation environment; and safety, thinking about robust materials for site features used for sensory stimulation, safer environments for people who may elope or roam,

and reducing injury related to challenges with proprioception. Some guidelines mention the need for a variety of activities and spaces that provides interest for different scales of social gatherings, along with exploration and skill building. The next theme, predictability, emphasizes legible functions of an environment. A clear understanding and delimitation of a space's functions make it easy to manage expectations of an experience, and to know what may be coming next. Finally, navigability which emphasizes wayfinding and reducing confusion when going between different environments or situations. Essentially are journey's to a destination easy to undertake.

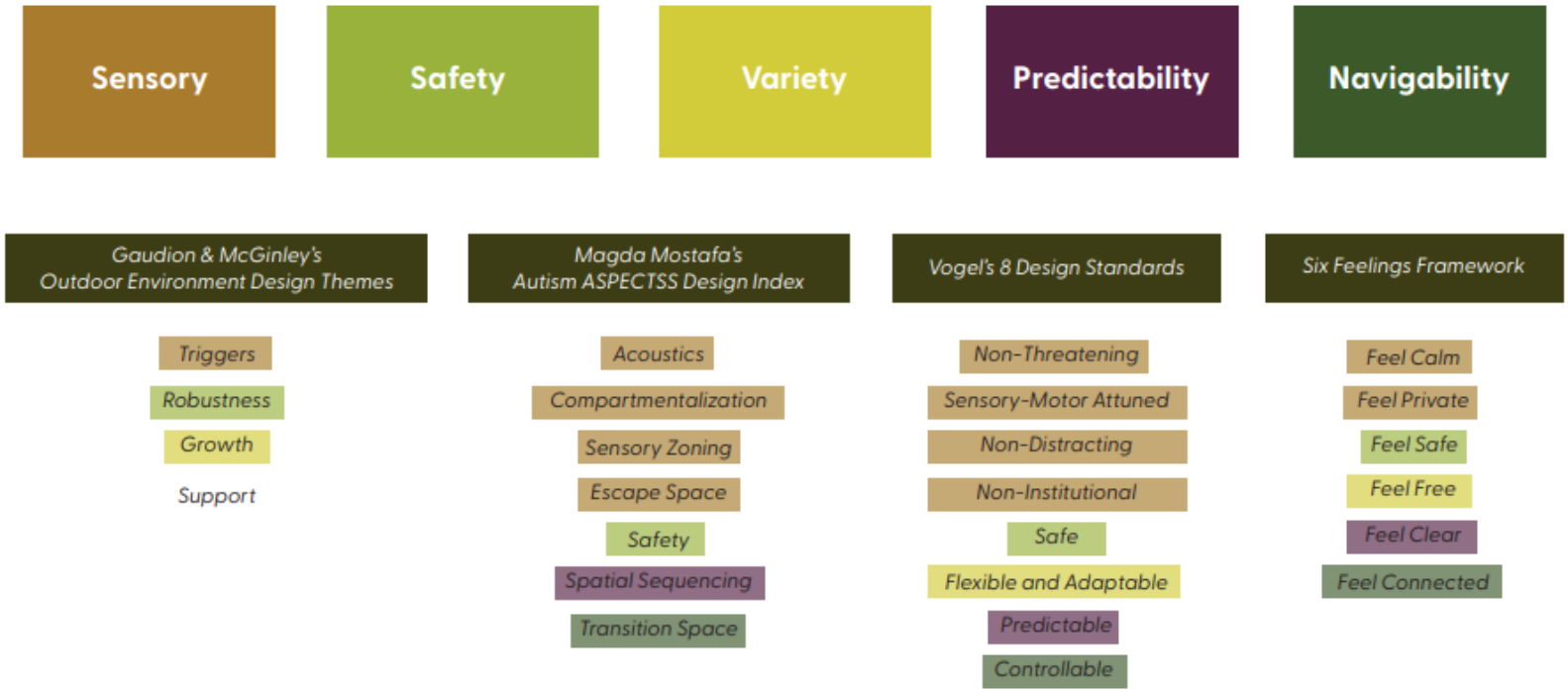

Figure 11. Themes That Emerged Across Design Guidelines and Frameworks. Source: Ada, 2023

Chapter 3: Methods

This chapter will cover methods used to inform the design of the Palmer Park Community Center site. This project utilized a mixed-methods approach which included review of relevant case studies; conversations with design professionals, and a focus group of adults with autism; and site inventory and analysis.

Case Studies

A few landscape architecture projects exemplified the common themes found in the design guidelines and frameworks exploration. The following selection of projects addresses ASD-related needs at a range of scales, each facilitating a different type of relationship between target user groups and the landscape. These projects serve as case studies for the final design results.

Case Study 1: Sweetwater Spectrum

Landscape Architect: Roche and Roche

Location: Sonoma, CA

Figure 12. Planting Design in Sweetwater Spectrum. Source: Maytum

This award-winning project was initiated by a group of autism families hoping to address the gap of housing options that supported ASD-related needs. The vision was an inclusive residential community specifically designed for autistic adults seeking independent lifestyles. Roche and Roche approached the project with a similar system of design themes as distilled in Chapter 2, looking to create a predictable, simple, and sensory-friendly outdoor experience within the community. The Roche's referenced Sherry Ahrentzen and Kimberly Steele's *Advancing Full Spectrum Housing: Design for Adults with Autism*, explaining that the landscape needed to strike a balance between having enough simplicity to reduce provoked stress while also providing enough stimulation to avoid an uncomfortably insipid experience. Choices in physical features, materials, planting, and layout were critical (King, 2016).

The community layout has the personal homes facing inward toward a landscape common. Its linear form facilitates a clear order of spaces, which is

visually aided with physical thresholds signified by either a structure (*Figure.* 13) or a change in material.

Figure 13. Threshold Into A New Segment of the Community. Source: Sweetwater Spectrum

The landscape architects used changes in surface materials and overhead structures to indicate thresholds from one section of the community to the next. The main circulation path is wide and easily discerned, with a slight sway so that it is not "too-orderly" or monotonous. A mass planting design-style emphasized complementary textures, rather than complex and energetic interplanting (*Figure*. 12). The Roche's combined high-branching and low-profile matrix beds to ensure that sightlines were maintained within the property. The planting scheme is identical around each individual home's courtyard. In the community area between the homes, there are nooks that are given distinct identities that are created through intended use, planting, or materials. Vertical structures indicate the function of specific spaces such

as the use of short concrete walls to designate a private home area. Taking into account that people with ASD tend to be drawn to water, a noted safety feature is the dense, smooth fencing used around the perimeter of the pool to prevent climbing into the pool space. Landscape rooms were built in for small-scale gatherings or individual escape, each having a distinct identity including the popular hammock room (*Figure.* 14) that residents used if they wanted a movement sensation (King, 2016; *Sweetwater Spectrum*).

Figure 14. Hammock Room and Plant Massing in Sweetwater Spectrum Community. Source: Sweetwater Spectrum

Case Study 2: Morgan's Garden

Landscape Architect: Virginia Burt

Location: Pepper Pike, OH

Morgan's Garden is a private half-acre garden for the Monarch Lifeworks School, a vocational school for adults with ASD Level 3 (*Figure*. 15). Being diagnosed with ASD Level 3, these individuals have higher support needs and are typically accompanied by caregivers throughout the day. In defining stakeholders, Burt took

into account the needs of caregivers, as they are as much a part of the garden experience as the autistic adults. Clear sightlines for the caregivers and non-toxic plant selection were particularly important in this context so that staff could feel confident with their clients independently exploring the garden. The garden program aimed to be legible, predictable, and offer various sensory stimuli levels. Small landscape rooms and moveable furnishings provided areas, including swing benches for users who may need to experience repetitive movement (*Figure*. 16). A new concept that this landscape introduced was a loop configuration, with a predictable, legible journey, and clear start and end (*Figure*. 17).

Figure 15. Aerial Photograph of Morgan's Garden. Source: Csla-aapc.ca

Figure 16. Bench Swing Room in Morgan's Garden. Source: Csla-aapc.ca

Figure 17. Small Lop Within Morgan's Garden. Source: Csla-aapc.com

Case Study 3: Autism Nature Trail (ANT)

Landscape Architect: TWLA

Location: Castile, NY

Figure 18. ANT Gateway Structure. Source: Carrick, 2022

The idea for this project sprung from a desire to create a nature trail that was welcoming to everyone, but prioritized design for people with ASD and other developmental disabilities. The process was led by three local residents who were friends and loved ones within the Autism Community. Through consultation with Dr. Temple Grandin, a prominent advocate and speaker on autism, the design team made key decisions on wayfinding, layout, and location. Dr. Grandin emphasized that the trail must have thorough wayfinding that indicating activity zones and location along the trail. Grandin also emphasized the need for places off the trail for escape if an individual

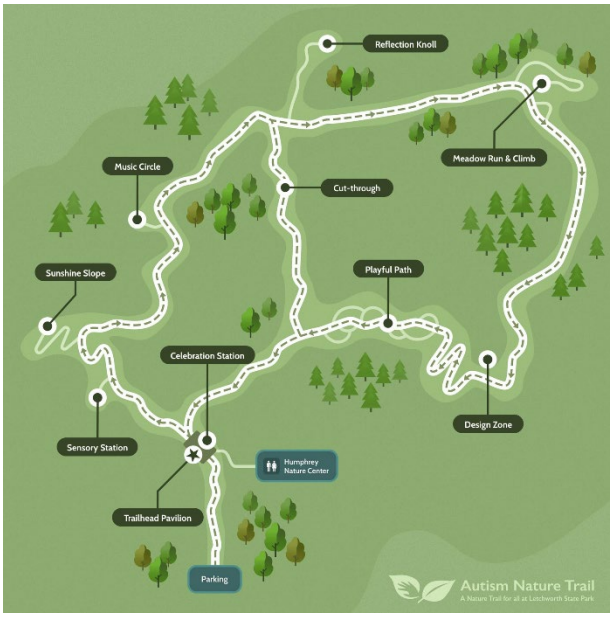

Figure 19. Autism Nature Trail Map. Source: Autism Nature Trail, 2023

becomes uncomfortable. Finally, Grandin encouraged a loop configuration, that way the trail had a consistent beginning and ending to provide a sense of closure for an autistic visitor.

The ANT incorporates similar design ideas from Case Studies 1 and 2 such as the loop configuration and physical indicators of space boundaries. However, the larger context of this space warrants a few modifications that are actually quite applicable to this thesis project's site. For instance, the ANT loop is about a mile long, so a cut through trail (*Figure*. 19) is added provide choice of how far one wants to go on a particular visit. Clear wayfinding with visual, tactile, and written communication forms are especially important to navigate the site (*Figure.* 20). Part of this wayfinding system is the entry pavilion that gives visitors a clear beginning and terminus to the journey (*Figure*. 18). Something unique about the forest setting is the value of exploration in the natural environment. The secondary pathways that

allow for people to take personal space from the main trail, also encourage this type of experiences.

Figure 21. Multi-modal Communication Signage for the 'Design Zone', one of nine activity stations along the ANT. Source: Driffill, 2021

Figure 20. Playful Path Alternative Routes on ANT. Source: Exploregennesseevalley.com

Interviews

Interviews were conducted with three different professionals coming from various perspectives on the relationship between individuals with ASD and the landscape. Virginia Burt, a landscape architect, led the design team for Morgan's Garden (Case Study 1). As an autism parent, Maci Nelson, the second interviewee, brings an intimate knowledge of landscape and autism from her experiences with her son. She blends the role of landscape design professional and autism community member. Kimberly Hubscher, the third interviewee, brings the perspective of a caretaker for adults with ASD. She brings her experiences and observations from integrating time outdoors into some of her clients' routines,

Interview 1: Virginia Burt, FASLA, Founding Principle of Virginia Burt

Virginia Burt is a landscape architect and the founding principal of Virginia Burt Designs. In 2022, her firm's project, Morgan's Garden won a CSLA Award of Excellence in the Small-Scale Landscapes category. This interview aimed to learn about how she and the design team applied design theory and ASD research to their design decisions. The following are the questions asked, and Burt's (denoted by 'VB') responses:

MA: The readings that I've found on autism-friendly environments emphasize space transition and differentiation, what were the design strategies that the team used to create an easily navigable space?

VB: It must be easily cognitively understood…less mystery. Our goal was to create a space for these [individuals] to freely head outside and create self-directed experiences. It has been designed specifically to have sightlines, so you can see from

the windows and across the garden at all times. We also used a recognizable form...one big loop in the garden. The loop creates a discreet circuit. One can see from one end to the other. You are able to understand where others are, where you are going to be. And we made sure there were multiple ways to get into it and multiple offshoots to different garden rooms. However it was all anchored by the loop.

We also have a welcoming entry to the garden from the building that encourages them to step beyond. With ASD, certain things such as moveable parts, things that they can move work well.

MA: What were the standout research and theories that drove this design?

VB: Therapeutic design guidelines. Indeed those are helpful and you should be using them. However, just like anything, you should not be using them as a recipe. Remember, as they say "if you've met one person with ASD, you've met one person with ASD."

MA: How did you approach planting selection? Material specs?

VB: Everything has to be durable and also allow for a myriad of behaviors such as spontaneous pacing or rocking. Apply this to anything that would be used for energy expenditure. For a seamless transitions from one material to another we picked materials as part of a cohesive series. We didn't use a whole different kinds of paving. You're not trying to emphasize contrast.

For planting design, we applied the high-branching and low-planting scenario. Staff sightlines are critical. You have to design for staff and caregivers just as much. All of the parents have come to us and asked us for our poisonous plants list. A very specific

piece about this is making sure we used non-poisonous plants because the individuals [are inclined] to put things in their mouths.

MA: What were some of the take aways from this project?

VB: That there are truly angels out there that support a project like this. I would always say, believe that angels are there to help you do this kind of work. One of our ultimate surprises and delights, we received an image from the staff at the school…it was a movie night…to see them and people all from the community laying on the lawn with lawn chairs and coolers…and seeing people on the loop in the background…all this to say, that was the goal, to bring people to this work. These places touch our hearts.

Interview 2: Maci Nelson, Parent of Child with Autism and Landscape Designer

Maci Nelson is a landscape designer based out of Ohio, and the host of *The Landscape Nerd Podcast*. Her connection to ASD comes through the perspective of a parent. She and her young son with ASD frequently spend time in nature. Through her platforms on social media, she has elevated awareness of the relationship between landscape architecture and ASD. This conversation was informal rather than an interview with a set question structure. It took the form of a thought sharing session, with particular focus on her perspective as a landscape design professional and autism parent.

Maci first addresses the isolation that autism families often experience, especially while their loved one with ASD is young. “It is hard [for autism families] to gather”, Maci says, as children are learning their own boundaries and comfort levels with the environment as well as the other people that occupy it. As mentioned

in the literature review, people with ASD may experience challenges transitioning into unfamiliar situations. Something that she was taught as a parent of an autistic child is to “scaffold the skills”. Maci describes this as the processes of building up to a goal, and it is easily applied to a scenario of getting to know a new landscape like a public park. She encourages mindfulness of the journey –breaking that transition down into steps. As one moves closer to a bigger destination, there should be checkpoints along the way where one can pause if time is needed to comfortably move further. The checkpoints can also be the goal of the day. One strategy we discussed was to design progressively lush pedestrian routes to the park that hint at the environment ahead, peppered with benched nooks and other forms of places to rest. Essentially making sure that the places on the way are also places to be.

As a follow up, Maci brought up the importance of scale. She comments on the familiar landscape design move of making spaces big and open. There is value in having big open concept landscapes, but for the Autism Community smaller interventions are important to include. Areas that feel more intimate may be friendlier for autism because it offers time and space to assimilate to their environment, especially when considering the scaffolding strategy. Maci mentions that “before going into a space with my son, I ask myself, ‘How long can we stay in this spot?’”

Maci has interviewed landscape architects and designers of autism-friendly spaces, including the designers of the Autism Nature Trail. Design moves that she supported from projects she’s encountered were the inclusion of a loop with options for exploration, symbols and signals of where to go within a space, interactive elements, and places for people to interact with an area of interest from a distance.

Interview 3: Kimberly Hubscher, Community Development Specialist, Kennedy Krieger Institute

Unlike the previous two interviewees, Kimberly is not a design professional. Rather, she is squarely in the stakeholder category for this design. One facet of her job is to be a caregiver for individuals with ASD. Her experience with ASD and the landscape comes from her years of experience bringing clients to local parks and other outdoor environments. This conversation also followed an informal structure.

Kimberly touched on four themes of the most ASD-friendly park spaces that she and her clients have encountered: navigability, sensory flexibility, predictability, and safety.

She highlighted the importance of paved pathways and wayfinding within the park. At the materiality-level, paved pathways are clearer to understand and easier to use for people with varying levels of physical abilities and fitness. At the system-level, she encourages multiple pathways that promote exploration and new experiences in the landscape. Short and long journeys should be integrated into the pathway network. Again, to accommodate various physical abilities, but also to provide an element of choice in what an autistic visitor may want to experience during a given park visit. A helpful addition along a network of paths would be a system of indicators that let people know where they may go to escape a situation if needed. Some people may become less verbal or communicative when stressed, so having a system where one may find an escape from a stressful situation without asking for help is important.

Both low- and high-sensory environments can be enjoyed by autistic individuals. Kimberly mentions that there should be enough variety in the landscape to provide sensory input balanced with the presence of low-sensory areas for times when the opposite is needed. Sensory input features may come in the form of textures, moveable or interactive elements, and space where people may get their “jitters" out, referring to self-stimulating activities such as bouncing or swinging. Another factor to take into consideration is the variety of physical abilities amongst people with ASD. Incorporating areas that provide different levels of physical challenge such as flat and hilly paths, short and long loops to traverse, etc. can cater to a wider breadth of physical activity interests. Lastly, areas to retreat are critical to include for situations where less stimulation is desired. Here she also mentions shelter from the elements.

Transitions into a new space or situation are often challenging for people with ASD. She states, “Sometimes people with autism might be all for going somewhere, but once they get there, they refuse to get out of the car (Hubscher, 2022).” Kimberly suggests finding solutions that can help an autistic visitor prepare for the next destination and make the journey into the park seem like less of a transition somehow. Preparedness also came up about encounters in the park. Outdoor environments can be unpredictable, whether it be the people, animals, or natural phenomena in the park. Having signage may help with the experience of these unpredictable encounters.

Finally, as a caregiver, safety is a key determinant of whether she takes her client to a space. She mentions that if she does not get phone service in a park, she

will not take her client there. In case of emergencies, she would be unable to contact help. Providing WiFi would encourage her to utilize the park. As a final note, she talks about elopement safety. Elopement is a common challenge for people with autism where they like to wander or run off. This could be in response to feeling overwhelmed or uncomfortable in their current setting. She mentions that this stops many families with someone with autism or who elopes from going into outdoor spaces out of fear that they may find themselves in a dangerous situation. Kimberly proposes elope-safe areas or elements that are not necessarily closed off from the surrounding park but something that helps families feel comfortable if their loved one roams.

Focus Group

Gathering input from autistic self-advocates was a critical component of the design research for this project. On April 20, 2023, a focus group was held via Zoom with three autistic self-advocates between the ages of 18-29. These individuals are part of the University of Maryland's Social Interaction Group Network for All (SIGNA) community, with both current and alumni members in attendance. SIGNA is a social group for autistic UMD students with the mission to bring these individuals together "to enjoy friendships, share ideas, support each other, and just hang out (Resources for Autistic Students)." The purpose of this focus group was to gain a better understanding of participants' past experiences in public parks, specifically how they use them, what creates positive or negative experiences, and their perspectives on how parks may be improved, if at all.

The semi-structured Focus Group questions were selected to paint a picture of a typical day at a public park, the journey to the destination to the time spent within the park. For the final section of questions, the intention was to put design decisions in the participants' hands, asking what changes they imagine should be made. In total, the participants were asked 14 questions.

Focus Group Questions
Introductions 1. What is your favorite public outdoors space? Why is it your favorite? 2. What are 5 words that come to mind when you think about public parks? These can be individual words or a short sentence II . A Day At The Park 3. In the last year, how often did you visit outdoor parks on average? 4. Who do you typically go with? 5. How do you get there? 6. What types of activities do you like to do at parks? III. Your Park Experiences 7. What creates pleasant/ positive experiences for you at the park? 8. What creates unpleasant/ negative experiences for you at the park? 9. What are some factors that make it easier to use a park and its amenities? 10. What are some factors that make it harder to use a park and its amenities? 11. Are there outdoor spaces in parks that you avoid? If so, why? IV. Re-thinking and Re-designing Parks 12. Do you think parks should be redesigned for people with autism? Why or why not? 13. Thinking about the experience of people with ASD, what types of support should be present in parks that you don't typically see now? 14. Thinking about the experience of people with ASD, if you had the power to write a rule/ law that makes one improvement to all park spaces, what would it be?

Qualitative data analysis of the question responses revealed four overarching themes: sound sensory sensitivity, navigability, places away, and clarity. Across the 14 questions asked, these themes appeared responses to between six to seven questions each.

Navigability (7/14)

Wayfinding was brought up as particularly important in environments with trails, infrastructure, and an overall large footprint where all areas of the park are not visible from one viewshed. Accurate and usable wayfinding and maps made park use easier for participants. One focus group participant brought up the idea of markers with names of destinations and distances to these destinations. Navigability was an expressed concern, as users felt it important that a park is not confusing to be in. In situations where a autistic user may be close to a meltdown, there should be as many directional tools as possible to help that individual try to find a respite space.

Clarity (7/14)

Going hand-in-hand with navigability, clarity of boundaries at all scales. From knowing the park extents to defined activity areas to maintained trail edges. This theme is another method for reducing confusion and creating feelings of comfort within the park space. Understanding the spatial dimensions may help avoid people getting lost and avoid entering spaces that the user does not intend to enter.

Sensory Sensitivity (6/14)

The key concerns under this theme were noise sources, primarily from human activity, and the ability to be away from said sources. Positive experiences occurred most when there were areas with a sense of quiet. Areas with high noise and activity levels were avoided.

Places Away (6/14)

This theme relates to human activity as well. Participants voiced a desire to see these more consistently, describing it as a support that they did not typically see in parks today. Fewer people and options to avoid overly crowded, noisy areas created positive experiences in past park visits. Simply put, they felt that there should be areas for people who "need a break."

The overarching themes ultimately reflected in the laws that the participants came up with in the final section of the focus group:
Thinking about the experience of people with ASD, if you had the power to write a rule/ law that makes one improvement to all park spaces, what would it be?

"I would write a law which says that all park spaces should have clear boundaries and signage, so as to not confuse guests."

"All parks with outdoor activity areas must have quiet spaces away from the crowds and noise, and parks with indoor activity areas must have quiet rooms."

Other design-related feedback from participants included adding unique experiences that were conducive to exploration, shade structures, activities that were welcoming to adults, and infrastructure for multi-modal transportation to the park.

Cross Referencing

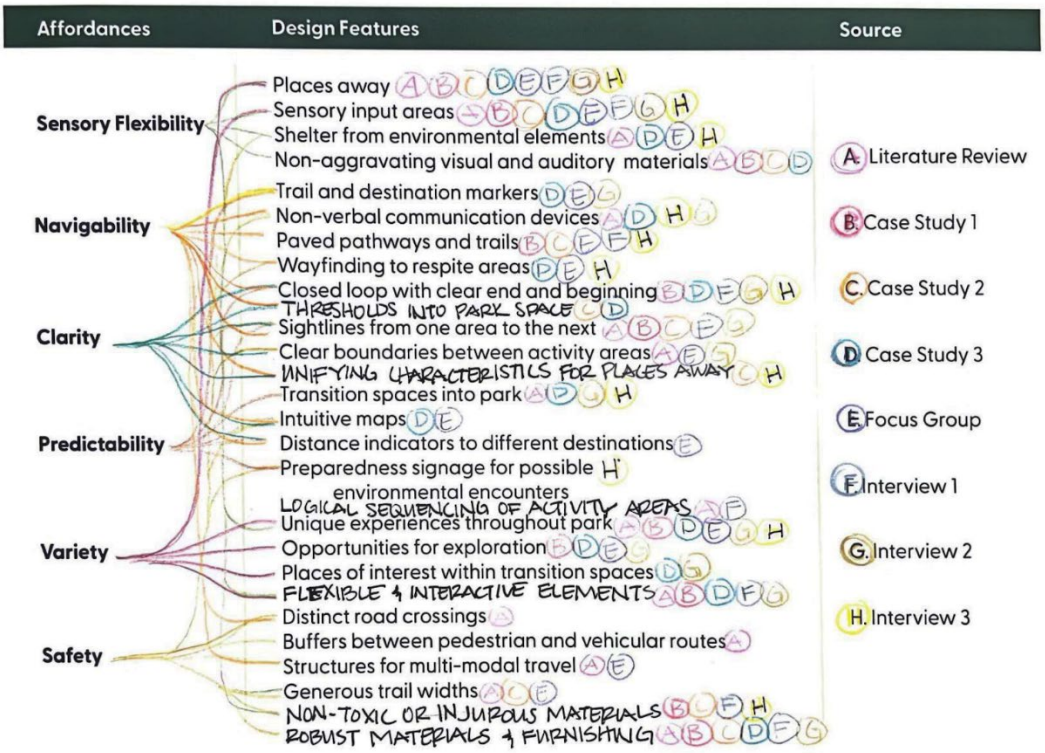

Figure 22. Synthesis Process of Design Themes For Autism-Friendly Landscape Design. Source: Ada, 2023

Distilling the research and information on better outdoor spaces for autistic adults (*Figure.* 22) from the literature review, case studies, focus group, and interviews, six themes were found: sensory flexibility, navigability, clarity, predictability, variety, and safety. These themes will form the basis of the design results:

1. Sensory Flexibility - Having areas of various levels of activity and stimulation are encouraged to accommodate an individual's sensory needs as they arise.

2. Navigability – Providing ample tools, including wayfinding, signage, and spatial organization to create legible journeys to different destinations.
3. Clarity – Making design choices that distinguish the boundaries of a space
4. Predictability – Using layout, signage, and built-in transitions that aide a visitor's ability to know and prepare for what is coming next in a journey.
5. Variety – Hand-in-hand with sensory flexibility, providing interesting and unique experiences that encourage exploration, especially experiences that are inviting to adults.
6. Safety – Considering the safety of a visitor and the support that may be accompanying them with sightlines, materiality, and routes to remove oneself from a situation.

Chapter 4: Site Inventory and Analysis

The hypothetical design component of this project is informed by the literature review; and interviews and focus group feedback provided by members of the Autism Community. Maryland is highly ranked amongst US states with the most accessible autism resources (*Figure.* 23) (Ning, et al., 2019). The state is home to several

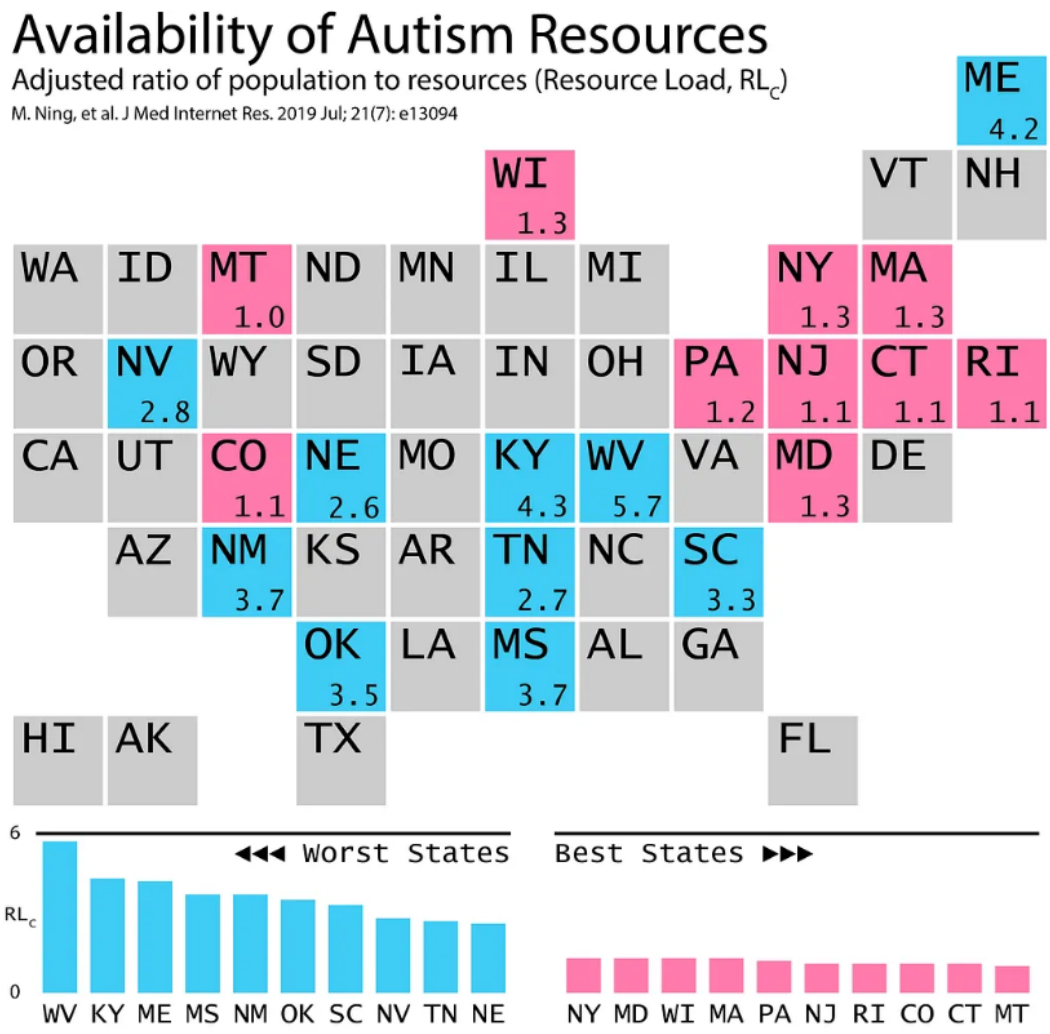

Figure 23. US State Rankings By Availability of Autism Resources. Source: Lawerance, 2019

established organizations and communities of support for people with ASD including: the Hussman Center for Adults with Autism, the Kennedy Krieger Institute, and Autism Society chapters in Howard and Baltimore County. Montgomery, Howard, and Baltimore City County are well-known hubs for autism resources. This project focused on a site in Prince George's County, looking to the work of the aforementioned counties as precedents. To identify a site, the Maryland-National Capital Park and Planning Commission (MNCPPC) was consulted to create a short list of public parks within their system that have potential to facilitate this project's

mission. Preference was given to sites with indoor facilities for the desired benefits of shelter and relief areas. Ultimately, the Palmer Park Community Center was chosen as the site due to its placement close to neighborhoods and frequent use by MNCPPC's Therapeutic Recreation Program . The following site inventory covers abiotic, biotic, and cultural factors. Site analysis, integrated throughout, interprets existing site conditions, deciphering how they may inform an inclusive and autism-friendly park design.

Site Context

Figure 24. Palmer Park Community Center parcel context within Maryland. Source: Ada, 2023

Palmer Park Community Center is located in Landover, Maryland (*Figure.* 24). It is one of forty-six community centers in Prince George's County (*Figure.* 25). Landover, Maryland is an unincorporated community made up of several subdivisions including Ardwick Park, Kentland, Kenmoor, Dodge Park, Brightseat, Columbia Park, Village Green, White House Heights, Summerfield, and Palmer Park. According to 2020 Census data, Landover is home to just under 26,000 residents with

a median household income of $64,127 (*U.S. Census Bureau quickfacts: Landover CDP, Maryland*).

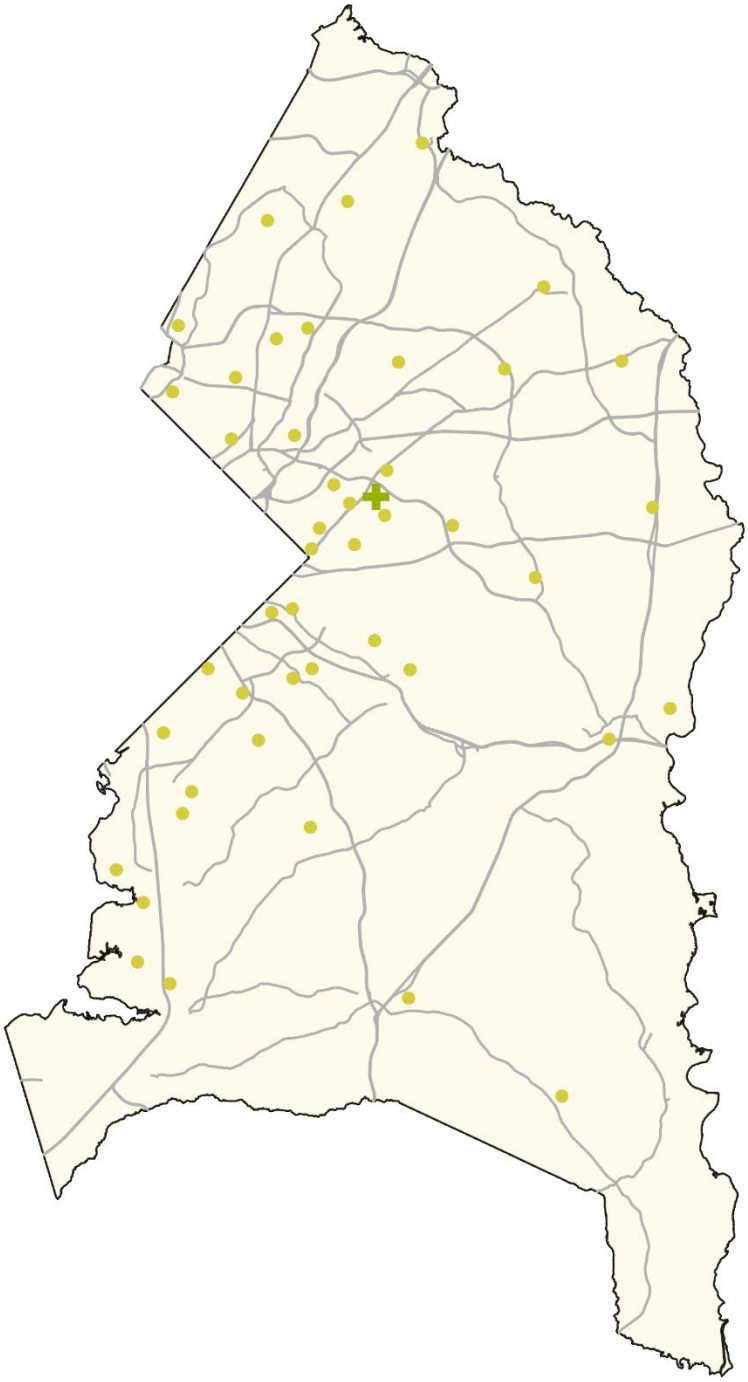

Figure 25. Community Centers within Prince George's County. Palmer Park Community Center indicated with cross symbol. Source: Ada, 2023

Figure 26. Surrounding Community Near Site. Source: Ada, 2023

The PPCC parcel is surrounded by residential neighborhoods, predominantly zoned for single family homes (Prince George's County Zoning Map) (*Figure.* 26). The Prince George's County Police Headquarters sits just southwest of the site. Along the southern edge of the site across Barlowe Rd. is a shopping center that includes a convenience store, nail salon, and MNCPPC's Sugar Ray Boxing Club. Next door to the shopping center is Victory House Senior Living.

The site's location is beneficial as it is already integrated within where people are living and may serve people across age groups having the senior living center close by. It's proximity to a commercial strip may also encourage a mutual boost in visitorship, as people are drawn to the area for its multiple points of interest.

Existing Programming

Palmer Park Community Center (PPCC) Facility (*Figure*. 27)

Figure 27. Aerial View of the Palmer Park Community Center. Source: Community design

In 2012, the Palmer Park Community Center (PPCC) building underwent a full renovation and expansion of the 1960s facility. PPCC reopened in 2016 with new classrooms, a fitness center, dance studio, collegiate-sized gymnasium, elevated track, kitchen, and multi-purpose room with a stage (*Palmer Park Community Center).*

Upon immediate entry, visitors will find the staffed lobby desk, bathrooms, and water fountains. In addition to the staff, the lobby desk has pamphlets and information resources sharing the current events of PPCC as well as other notable happenings across the MNCPPC system. Amenities on the first floor include the fitness center, flexible classrooms, computer lab, kitchen, dance studio, and the gymnasium (*Figure. 28*). Amenities on the second floor include a multipurpose room with stage, additional classrooms, and the elevated track. The second floor is accessible by stairs and elevator.

Several nooks in the building are furnished with seating for visitors to sit when not in the designated activity spaces. Throughout the building bulletins are posted outside of each

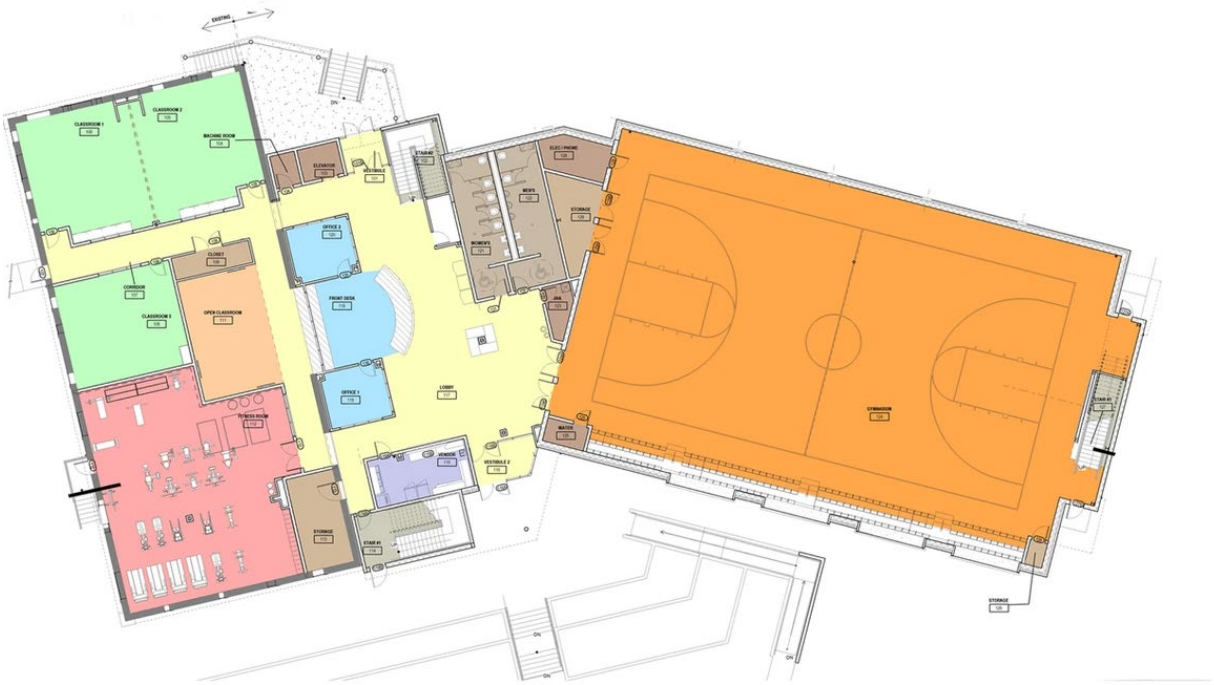

Figure 28. Palmer Park Community Center First Floor Plan. Source: Community Design

amenity space detailing the upcoming event calendar associated with each space.

The east-, north- and south-facing sides of the building have large windows, allowing for natural light during the day and affording views outside. In contrast, the west-facing facade, the side facing the park, has no windows. None of the aforementioned first floor amenities, except for the gymnasium, have windows viewing the outside. Emergency exits are present on all sides of the building. Two emergency exits open directly into the parking lot (*Figure.* 28).

Currently, the PPCC has recreational and social programming geared towards teenagers and to seniors. Teen programs range from crafting events to personal development and life skills workshops. Participation in these programs and use of the

indoor spaces are free for people 18 years old or younger. After 18 years old, PPCC visitors must pay a fee to use the facilities. Senior program participation costs a fee to participate and generally lean towards health and wellness. PPCC does not typically organize social and recreation programming for younger or middle-aged adults. The gap in indoor programming incentivizes putting more adult-friendly areas and activities in the outdoor park space.

Park Facilities

The exterior amenities of PPCC (*Figure.* 30) include a multi-sport field, two basketball half courts, a tennis court, and two playgrounds. Matthew Henson Ave. bisects the PPCC parcel, creating two separate outdoor spaces. The portion to the east of Matthew Henson Ave. is dedicated to the multi-sport field. All other aforementioned exterior amenities are on the portion west of Matthew Henson Ave. Pathways connect most of these park amenities, which are usable to the public irrespective of PPCC building hours. That being said, sunrise to sundown is considered the designated use period for the outdoor spaces. A passive experience with water is created on the pedestrian bridge over Cattail Branch Creek, which runs the length of the site, the stream flowing from east to west. It is an opportunity to view and listen to the flowing water below. This is the closest one may get to the creek via explicit infrastructure.

Figure 29. Bench Seating in Play Area. Source: Ada, 2023

There is a distinct lack of shade structures around the playgrounds, and seating is limited. Each playground has 2-3 benches (*Figure.* 29). No benches are present

around the basketball and tennis courts. Bleachers are the only seating around the multi-sport field. There is no outdoor seating around the entrances of the building. The bus stops on site have bench seating.

Lighting, a mix of LED and fluorescent light, is limited throughout the park. The multi-sports field is outfitted with fluorescent sports field lighting. PPCC's parking lot to the west of the building is illuminated by 5 LED light poles. In the park itself, there are only remnants of old lighting poles.

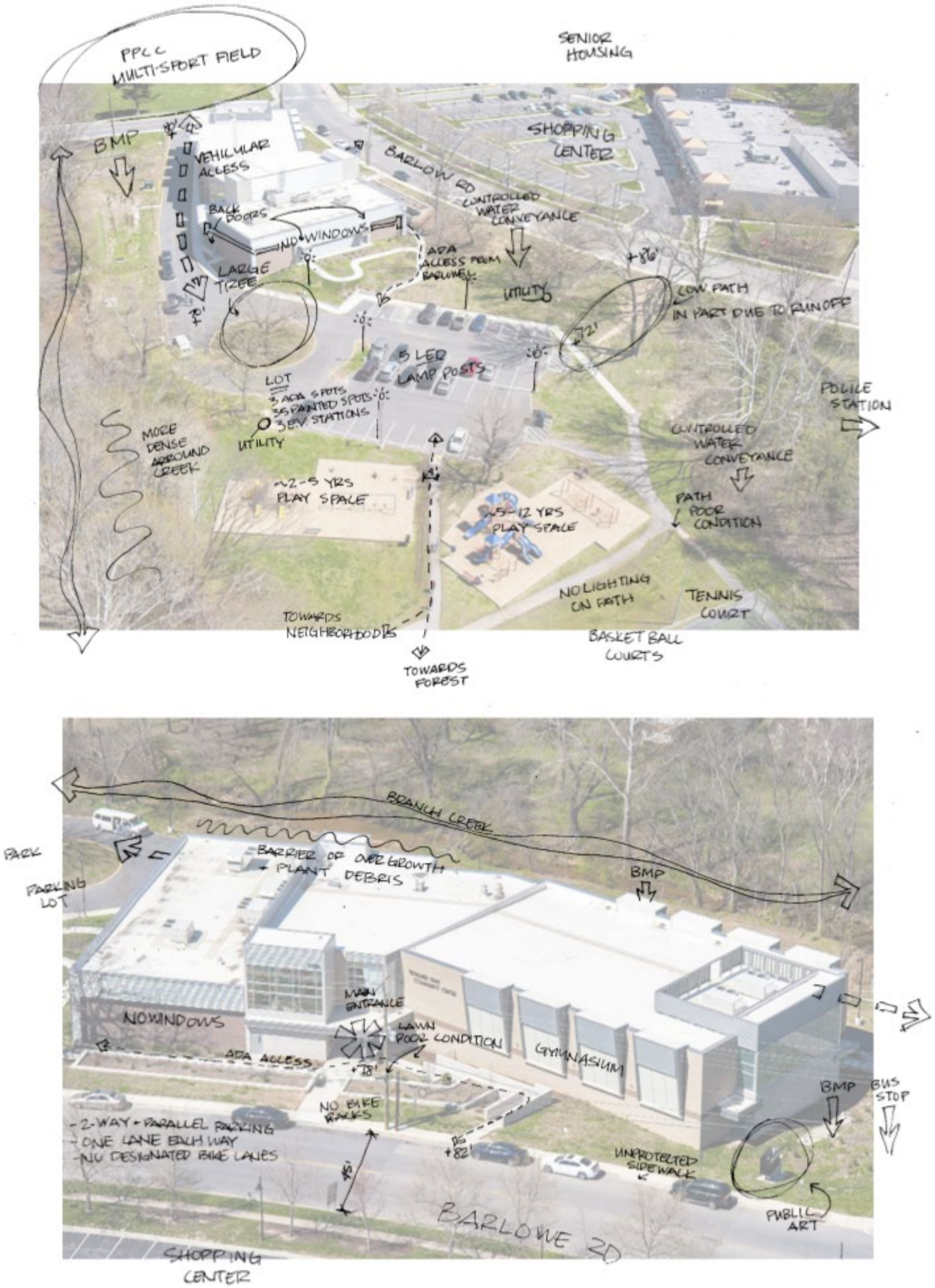

Figure 30. Site Inventory Around Palmer Park Community Center. Source: Ada, 2023

Hydrology

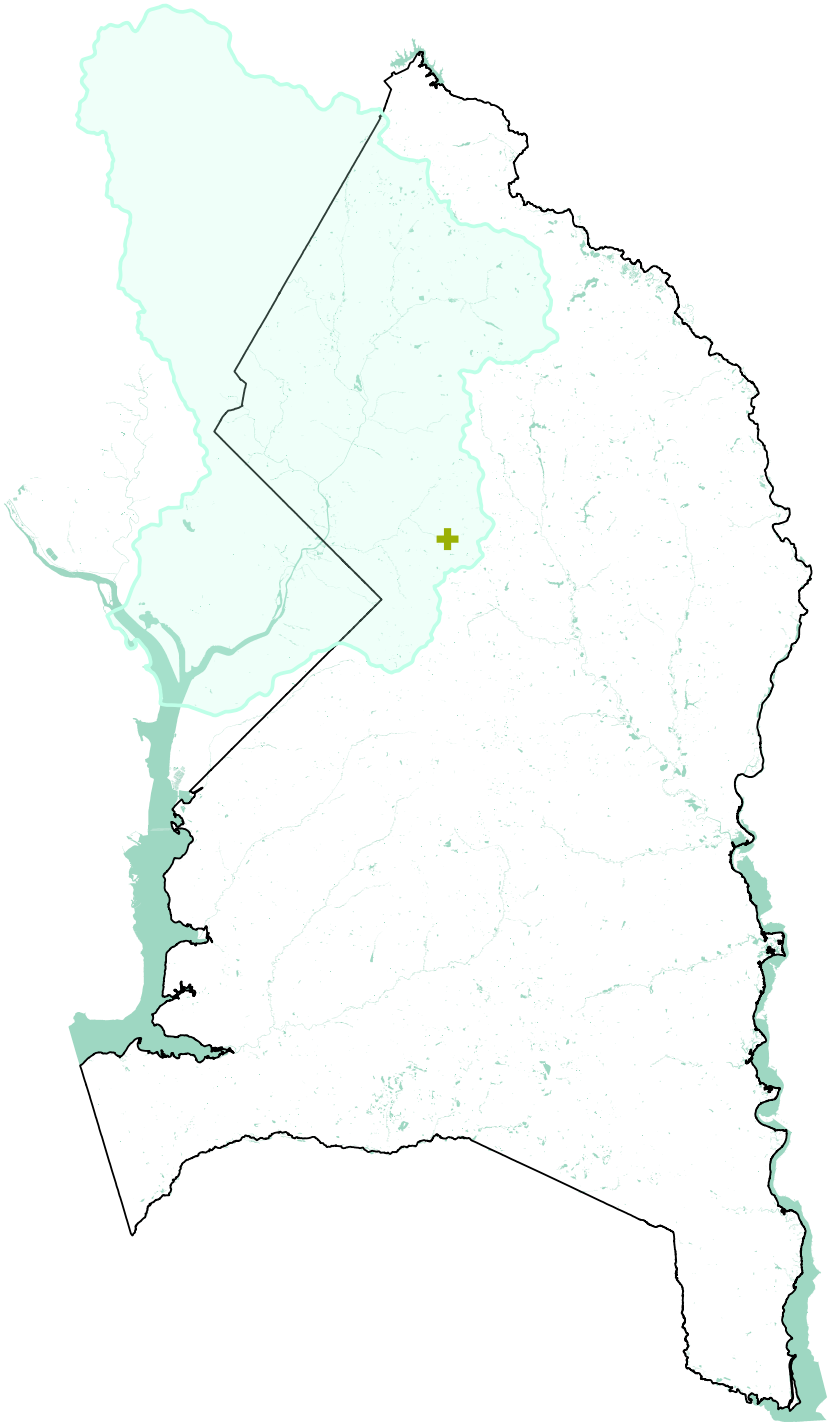

Figure 31. Site location within Anacostia River Watershed. Source: Ada, 2023

Sitting about an hour's drive from Washington, DC, the site falls within the Anacostia River watershed by way of the Lower Beaverdam Creek (*Figure.* 31). The main

hydrological feature on-site is the Cattail Branch Creek (*Figure*. 32), which runs east-to-west across the entire parcel. Cattail Branch Creek feeds into the Lower Beaverdam Creek, ultimately terminating at the Anacostia River.

Figure 32. Cattail Branch Creek. Source: Ada, 2023

Significant grade changes from Barlowe Rd. and Michael Henson Ave. exacerbate stormwater runoff into the park. Despite having two rain gardens and a channel to convey water, pooling is a frequent issue within the impervious parking lot. Run-off pooling is a chronic issue in the planting bed at the parking lot entry where a large *Quercus acutissima* stands. There are several instances of sediment build-up where water pooled around the perimeter of the parking lot. On the street level, run-off on Michael Henson Ave. drains directly into Cattail Branch Creek.

Additionally, there is evidence of run-off eroding the slope from Barlowe Rd. At the bottom of the hill, the water is conveyed via a stormwater BMP towards a drain.

Infrastructure

Figure 33. Circulation Analysis Map. Source: Ada, 2023

Pedestrian Access

A network of sidewalks connects the surrounding north and south neighborhoods to the site. Sidewalks are an average of 5' wide. Barlowe Rd. and Michael Henson Ave., the main access roads to the PPCC, are generously wide, 45'

Figure 35. Typical Condition of No Buffers Between Vehicular and Pedestrian Lanes. Source: Ada, 2023

Figure 35. Painted Crosswalks Leading to Site. Source: Ada, 2023

and 35’ respectively. Along Barlowe Rd. and Matthew Henson Ave., there are typically no buffers between the sidewalk and the road (*Figures.* 34). Where buffers do exist, lawn is the typical landscape condition. There are two ladder-style painted crosswalks at the all-way stop intersection of Barlow Rd. and Matthew Henson Ave (*Figure.* 35). These crosswalks connect pedestrians from the adjacent shopping center to PPCC, and PPCC to the multi-sport field immediately west of the Community Center. That said, the width of the roads feels uncomfortable to cross from a human perspective. Crosswalks are not well maintained, making visibility difficult for drivers coming around the curve of Barlowe Rd.

In the neighborhood along the northern edge of PPCC, traditional-style painted crosswalks are found at every intersection. These help create pedestrian and bicycle routes for residents to the pedestrian bridge entrance that feeds directly into the park’s play areas from the neighborhood (*Figure.* 36). Within the park 5’ pathways lead to each area of interest (basketball half courts, tennis court, playgrounds, and PPCC Main and secondary entrances).

Figure 36. Pedestrian Bridge to Neighborhoods from Park. Source: Ada, 2023

Cyclist Access

There is one instance of a dedicated bicycle lane on Martin Luther King Jr. Highway (*Figure*. 33). The bicycle lane does not have a direct route to any park entrance, however a non-hostile connection is created through the neighborhood via crosswalks, sidewalks, and slower speeds. Upon arrival at the site, cyclists have the option of locking their bicycle to the rack at the building's north entrance or to the handrails on the south entrance.

Figure 37. Palmer Park Community Center Parking Lot. Source: Ada, 2023

Figure 38. Parallel Parking Lane on Barlowe Rd. in Front of the PPCC. Source: Ada, 2023

Vehicular Access

Generous road widths create a more comfortable experience for drivers making their way to the PPCC. Once they arrive, there are options to park in the lot behind the PPCC or parallel park along Barlowe Rd (*Figure.* 37 & 38). The lot has capacity for 35 cars. Three parking spots in the lot are outfitted with electric vehicle charging stations in the parking lot. Without painted lines denoting individual spaces, parking on Barlowe Rd. is ambiguous with drivers parking whenever there is room.

Figure 39. Unsheltered Bus Stop on Michael Henson Ave. on East-facing Side of the PPCC. Source: Ada, 2023

Public Transportation Access

Figure 40. Sheltered Bus Stop Next to Multi-sport Field. Source: Ada, 2023

For public transportation, the Washington Metropolitan Area Transit Authority (WMATA) offers the A12 bus line, which makes a northbound and southbound stop along the perimeter site. Both stops have bench seating but only one is sheltered (*Figures.* 39 & 40). The A12 bus line makes 11 other stops within one block's distance from the site.

Objectively speaking, the site is well-connected with surrounding neighborhoods. The sidewalk network is extensive, with crosswalks at major intersections. Ample bus stops and places to park cater well to visitors outside of walking distance who use the WMATA bus line or drive a personal vehicle. Opportunities for improvement lie in the infrastructure quality. Barlowe Rd. is an intimidating street for pedestrians. Installing a landscape buffer between the sidewalk and Barlowe Rd. can narrow the roads to slow cars and create a better sense of security for people on foot. The crosswalk areas should be more conspicuous for both the driver visibility and for pedestrians so that they may identify where it is safe to cross the street. Sheltering bus stops should be consistent. In addition, signage and route navigation across the infrastructure can be improved to better communicate how a visitor can get to and from the park.

Sun Study

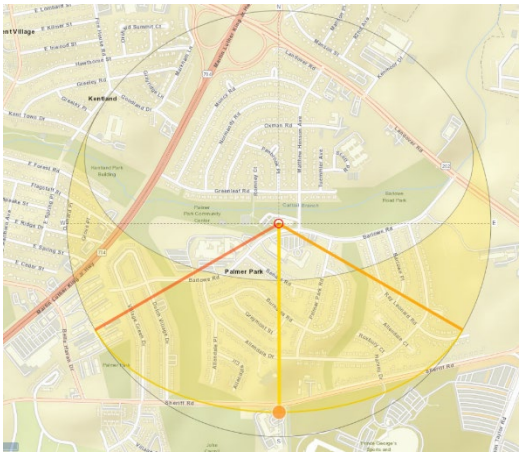

Figure 42. Winter Solstice Sun Path Over Site. Source: Suncalc.org

Figure 42. Summer Solstice Sun Path Over Site. Source: Suncalc.org

Sunlight casts onto the site from the south. Based on the Winter and Summer solstice sun calculations (*Figure.* 41 & 42), it is expected that the site will receive between 9-14 hours of sunlight (Suncalc). There are no shade structures or tree canopy along the multi-sport field, leaving event spectators exposed to the sunlight and other elements. The rest of the site east of Michael Henson Ave. sits at the bottom of a hill, much of which is forested. This canopied slope is situated along the southern portion of the site, providing shade for the area at the bottom of the hill.

There are opportunities to add shade elements to the park, particularly around the multi-sport field and any play areas. The forest canopy along the southern edge of the site advantageously shades most of the site. Part of this canopy should be maintained. Portions of the site should be allowed to bathe in the sun for microclimate variety.

Flora

Figure 43. Site Location within the Chesapeake Rolling Coastal Plains Ecoregion. Source: Ada, 2023

Ornamental trees, large canopy trees, and shrubs can be found around the parking lot and along walkways within the developed area of the PPCC site. Five mature trees around the perimeter of the parking lot provide some shade for the parking lot. The middle section of the lot lacks shade. The trees around the lot are large canopy trees that include *Quercus acutissima, Fagus americana, Quercus phellos,* and *Acer rubrum*. The pathway leading up to the PPCC main entrance from the parking lot is surrounded by ornamental trees such as *Cornus florida, Cornus kousa,* and *Lagerstroemia indica* (*Figures.* 44 & 45). The planting palette is a mix of native and non-natives (see appendices). At the time of this thesis project, no updated data had been collected on the plant inventory for the undeveloped portion of the parcel. Due to safety concerns, site visits did not extend into the deeply forested areas. Based on the site's location in the Chesapeake Rolling Coastal Plains ecoregion, it is assumed that the forest predominantly consists *quercus ssp* (Figure

Figure 45. Canopy Trees Around the PPCC Parking Lot. Source: Ada, 2023

Figure 45. Ornamental Trees Along Pathway to the PPCC Main Entrance From Parking Lot. Source: Ada, 2023

43). Other trees that may be encountered include *Fraxinus americana, liriodendron tulipifera, and liquidambar styraciflua, Carya glabra, Amalenchier arborea, Celtis occidentalis,* and *Cercis canadensis* (Highfield & Sprague).

Plant palettes for the park should take cues from the native forest trees within this ecoregion. There is a better argument to mix non-native ornamental trees into the palette closer to the PPCC for aesthetics, and these will be maintained. However, design further into the naturalized portion of the site should incorporate species such as those listed above.

Fauna

Evidence of wildlife were found on site visits in the form of tracks (*Figure*. 46) and scat. Birds and rodents were heard and seen in the heavily vegetated areas. Besides woodland animals, the creek provided habitat for amphibious and reptilian residents as well. The sightings of wildlife were sparse, likely due to the human presence and

late winter visit time period. With the site being part of the Anacostia River Watershed, it is assumed that one may encounter local wildlife associated with this watershed. This includes large mammals as large as the white-tailed deer to smaller creatures such as groundhogs, eastern box turtles, northern two-lined salamanders, and rat snakes (*A beginner's field guide to the plants and animals of the Anacostia river watershed*).

Figure 46. White-tailed Deer Prints on Site. Source: Ada, 2023

Educational signage should be installed describing the wildlife that one might encounter on a visit to the park. Spontaneous encounters with wildlife cannot, and should not, be controlled in this park setting. Familiarizing park visitors with the animals that also enjoy the park may create more comfort if an encounter does occur.

Figure 47. MNCPPC Signage at the Cattail Branch Creek. Source: Ada, 2023

Wayfinding Identity

MNCPPC Signage

MNCPPC has signs posted throughout the site referring to park behavior (*Figures.* 47, 48, & 49). Sign verbiage is generally polite. Signs are small and unassuming, perhaps so as not to detract from

Figure 48. MNCPPC Park Rules Sign. Source: Ada, 2023

the surrounding environment or for economic reasons. One may easily look past these signs, particularly the ones within the wooded areas (*Figures.* 47 & 48). Wayfinding signage amongst these interest areas is not present. In the park space behind the PPCC, this may be attributed to all interest areas being close and within the same viewshed. A sign on the pedestrian bridge from the neighborhood is the only indicator that one is entering the park (*Figure*. 48).

Figure 49. PPCC Signage Posted Outside of the Building. Source: Ada, 2023

Creative Gestures

A bird sculpture (*Figure.* 50) sits on the corner of Barlowe Rd. and Michael Henson Ave. It is one of a series of similar sculptures located throughout the county. On this site, it serves as a landmark and passive wayfinding device.

Figure 50. Bird Sculpture on the Corner of Barlowe Rd. and Michael Henson Ave. Source: Ada, 2023

A stormwater drain (*Figure*. 51) on site artfully expresses a message of environmental stewardship from the Department of the Environment. This is indicative of an investment in responsible practices to protect the local ecology.

Figure 51. Stormwater Drain Art. Source: Ada, 2023

There is a lack of unity across wayfinding devices, which is likely do to several installations of individual signs over time rather than creating a cohesive system upfront. Decluttering the

signage and developing a consistent wayfinding identity may help reduce stress for visitors navigating the landscape and more effectively communicate the signage messaging.

MNCPPC Organization Goals

In a notice put out by MNCPPC, Prince George's Parks and Recreation published their commitment to "providing quality services and park and recreation programs that are inclusive and accessible to all patrons" (*Accessibility and Non-Discrimination in M-NCPPC Programs and Services*, 2015, pp. 15-01). In Prince George's County, MNCPPC offers recreational programming designed to support the needs of various people with disabilities. These programs are run by trained staff, with a high staff to participant ratio to provide a comfortable environment for participation. In addition, adapted equipment is available for participants. The aim of this programming is to help individuals develop leisure and recreation activities, provide opportunities to socialize, build independence, and promote healthier overall quality of life (*Therapeutic Recreation Programs*).

Outside of organized programming, MNCPPC offers inclusion services upon advanced request including, but not limited to:

- Accessible golf carts
- Adapted equipment
- Audio description
- Assistive listening devices
- Information in alternative formats (e.g., large print or Braille)
- Sign language interpreters
- Trained support staff

Following the lead of the values already in place at MNCPPC, designing park environments that are inclusive of adults with ASD helps fulfill MNCPPC's commitment to accessibility.

Chapter 4: Results

The purpose of this thesis project is to create an autism-friendly recreational space for adults that is rooted in evidence-based design, as well as established universal and ASD-specific principles from other design professions. The following design results and program are informed by the themes distilled from the literature review, expertise from landscape architecture professionals and people who work with the Autism Community, and the stories and experiences of self-advocates.

Design Goals and Objectives

Goal 1: Cultivate an inclusive environment that promotes the autonomy and well-being of autistic adults

- Offer a wide range of social and recreational environments that accommodate a variety of ASD-related needs
- Provide for intuitive circulation and way-finding to ensure safe, comfortable, and multi-modal access to and within the park

Goal 2: Enhance and expand Palmer Park Community Center's current programming

- Improve on historically successful PPCC recreation amenities

- Integrate inviting activities for a wider range of age groups

Goal 3: Promote MNCPPC's ecological and accessibility goals

- Create an interactive, educational landscape that highlights local ecological systems
- Promote watershed health through improved stormwater interventions
- Broaden MNCPPC's commitment to providing quality services and recreation programs that are inclusive and accessible to all patrons

SITE PLAN

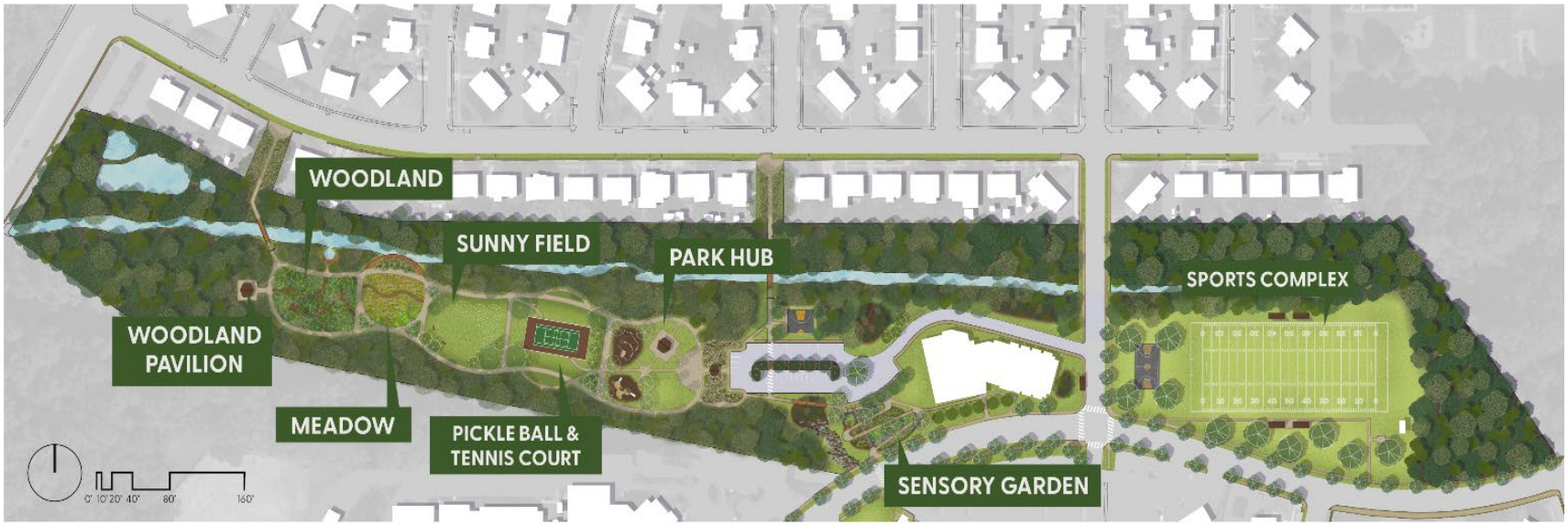

Figure 52. Site Plan of Cattail Branch Park. Source: Ada, 2023

Design Program

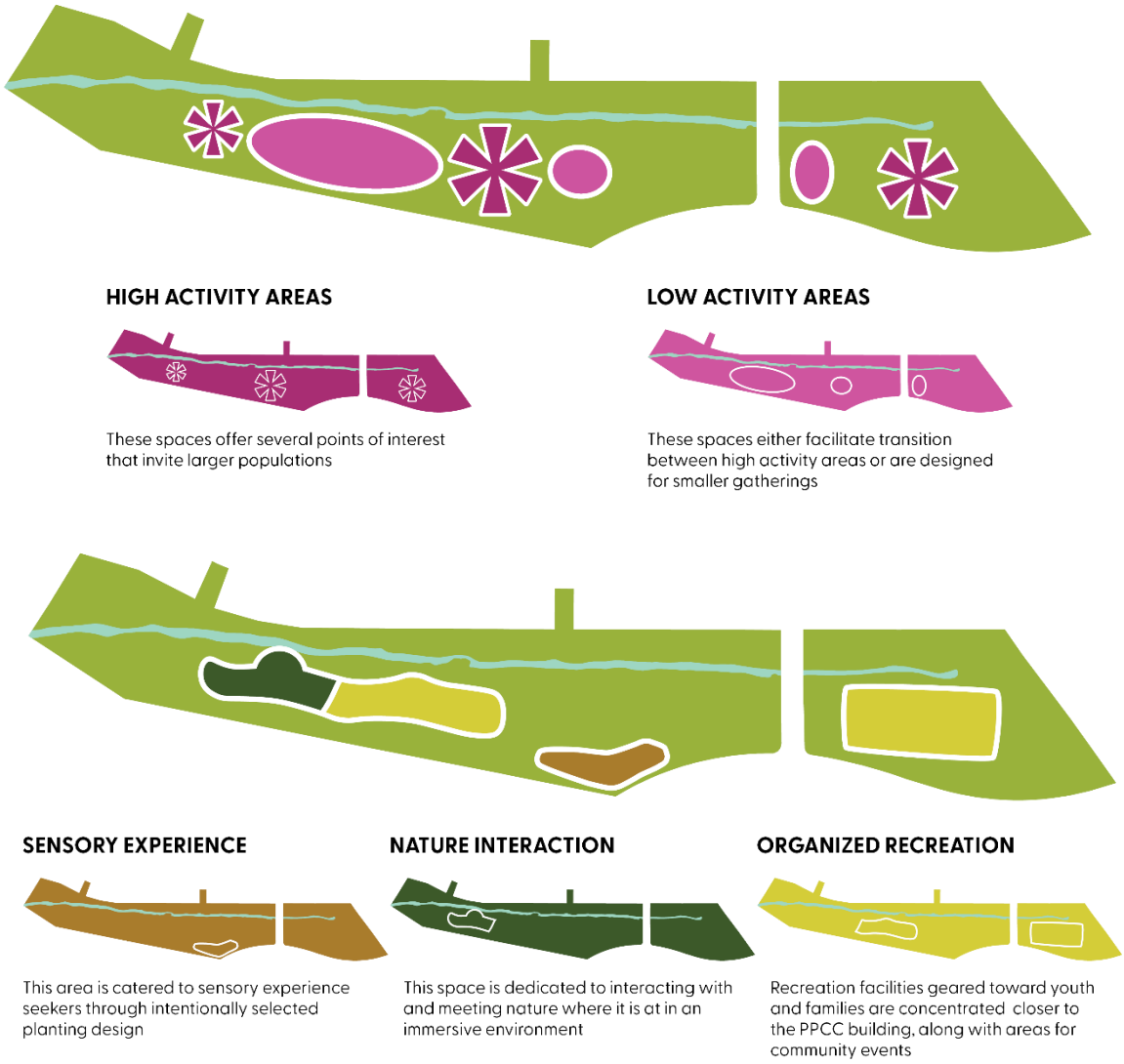

Figure 53. Park Program Concept. Source: Ada, 2023

The new park is named Cattail Branch Park, after the stream that ribbons along the entirety of the parcel. The programmed park area now extends 800ft westward from where the current basketball and tennis courts sit. Prior to landing in the park, visitors will experience a safer, more comfortable journey to the park with the addition of new street trees; improved bus stops; planting buffers between pedestrians and cars; and increased pedestrian infrastructure.

Programming is organized by two layers: activity level and activity typology. Areas anticipated to have high levels of activity are interposed with areas anticipated to have lower activity to allow space for transition or pause. There are three activity typologies: sensory experience, nature interaction, and organized recreation. A dedicated sensory experience garden is placed on the slope southwest of the PPCC, which doubles as an entrance from the street to the Cattail Branch Park. Organized recreation facilities in the new design are inspired by the popular existing playground and sports facilities around PPCC. The nature interaction areas function as environments where visitors may build a relationship with the local ecology through a variety of stations. The main paved trail is 10' to symbiotically accommodate MNCPPC maintenance vehicles and provide generous space for trail users to take as much distance from others as they need. The half-mile trail loop is designed to meander for added interest and rhythm to the journey. A similar effect is created by trail cut-throughs before and after each section. For visitors who may only feel comfortable experiencing a certain part of the park, this trail system can help facilitate a customizable visit.

Arriving at Palmer Park Community Center

Themes Addressed: Navigability, Predictability, Safety

Figure 54. Arriving at Palmer Park Community Center. Source: Ada, 2023

Visitors travel to Palmer Park Community Center through a myriad of means. Whether a walker, biker, driver, bus patron, one can begin to recognize they are close to PPCC as the streets become more lush. Slowly but surely street trees and shrubs appear, the palette reminiscent of the plants found in the park. A road diet provides room for a landscape buffer between the sidewalks and the roads. The narrower streets may encourage slower speeds, in turn, balancing the safety of vehicular and non-vehicular travelers (Daisa & Peers, 1997). Sidewalks around the site are repaved to have a consistent 6' width. Thus providing enough space for at least two individuals moving in opposite directions to pass each other. 8' wide crosswalks, accompanied by verbal and visual indicators, communicate where and when a

pedestrian may safely cross. The journey for bus riders are also designed for dignity and ease. Each bus stop is outfitted with a new shelter structure, protecting waiting riders from the elements. These are paired with comprehensive and visual route map signage.

While the entire journey from the front door to the park entrance cannot be designed for a precise and consistent experience, being intentional about impact areas immediately around the park may help adults with ASD as they approach their park visit. The *Six Feelings Framework*, developed by emerging urban planners, informs how this design handles pedestrian infrastructure. Ensuring that pedestrian walkways have ample width, providing planting buffer between vehicular and people lanes, slowing traffic, and adding amenities for comfortable public transportation use create safer journeys for people across modes of transportation.

Park Hub

Figure 55. Park Hub Area. Source: Ada, 2023

This portion of the park contains the attractions such as play spaces and the basketball half-court that were successful in the original park design. The new flexible lawn, park entry plaza, and gathering pavilion right inside the main gateway provide new venues for PPCC to extend their current social and recreational programming outdoors. Amongst these new experiences is the sensory garden, which brings a unique space to connect with the sensations of nature and an exciting moment for people across age groups. These particularly family-oriented areas are intentionally concentrated near the PPCC building to keep close proximity to functional comforts such as bathrooms or water fountains.

It is anticipated that this area will have higher levels of activity and crowds. Secondary pathways and respite areas, or places away, are available throughout this

space for individuals who may want to distance themselves from crowds and stimulating situations.

Arriving at Cattail Branch Park

Themes Addressed: Navigability, Predictability, Safety, Clarity

Figure 56. Arriving at Cattail Branch Park. Source: Ada, 2023

The main entry to the park is denoted by a headhouse-style gateway structure. This structure acts as a beacon, orienting park visitors to the start of the park. A park directory and bench seating are built into the gateway to provide time, space, and materials for someone to plan their visit within Cattail Branch Park. In addition, WiFi is made available in the park to ensure that visitors can stay comfortably connected while in the park, maintain a line of communication if needed, and supplement their exploration. Looking through the gateway, the path continues for 15’ to allow more time for a visitor to transition into the space.

Figure 57. Neighborhood Gateways. Source: Ada, 2023

The park headhouse gateway, bus stop shelters, as well as arbor gateways located at the pedestrian bridge park entrances (*Figure*. 57), form a themed suite of structures that convey a consistent architectural language across Cattail Branch Park. These structures are part of a new distinct park identity letting visitors know that they are approaching and entering this space.

Through the Sensory Garden

Themes Addressed: Sensory, Navigability, Predictability, Variety, Clarity

Figure 58. Sensory Garden. Source: Ada, 2023

For those interested in a more invigorating route from the street, a new ADA-accessible sensory garden path meanders down the Barlowe Rd. hillside into the park (*Figure.* 58). Plants of distinct scent, smell, sound, and touch line the path in dedicated beds. Beds are marked by post signs with visual and written labels. A stepped shortcut allows visitors to skip by or skip to parts of the garden as they please. If the sensory garden is not part of the day's itinerary, alternative paths are available to go straight to the Cattail Branch Park.

Connect With Nature

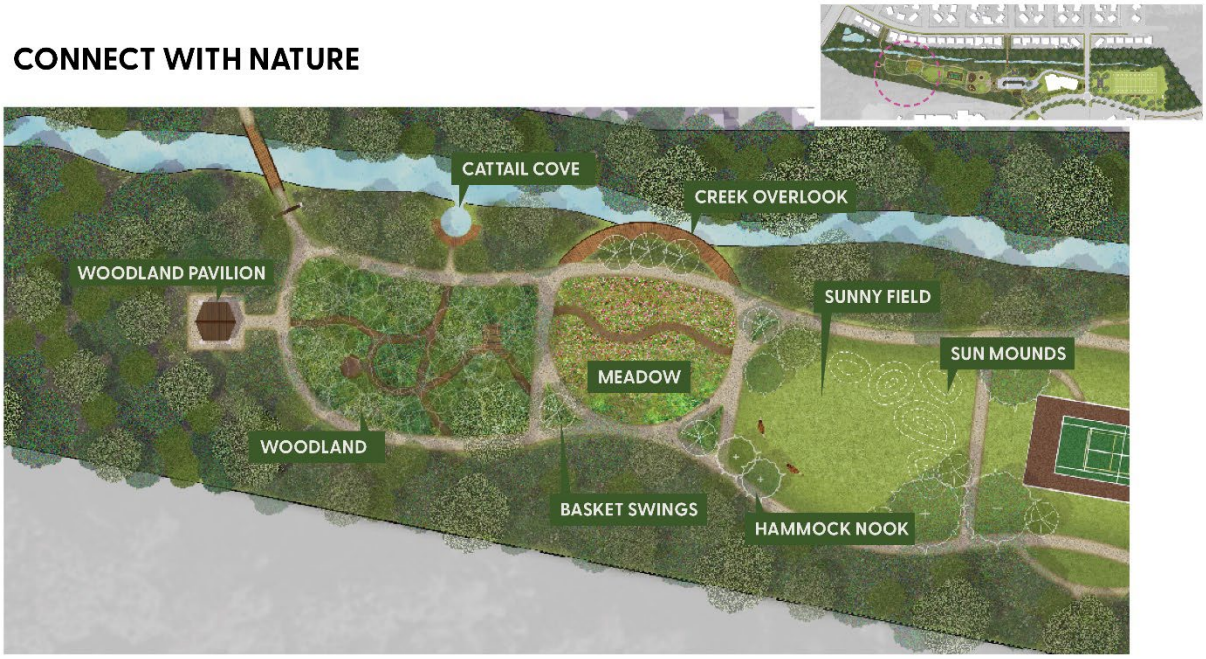

Figure 59. Nature Immersive Areas in Cattail Branch Park. Source: Ada, 2023

Moving westward into the park, visitors are slowly immersed into nature through three different landscape typologies: pasture, meadow, and woodland (*Figure*. 59). Sunny Field, as the name alludes, is predominantly open to the sunlight and has the appeal of a tidier grass landscape. As one moves farther from the PPCC building into the park, the surrounding progressively blends into the natural environment, becoming more canopied and lush. The main trail loop continues to meander along the edge of these large landscape rooms. Cut through trails help give a sense of control to visitors, providing options to go as far or as close to the different settings as they prefer.

Along the way, there are two opportunities to interact with the sounds and sights of the namesake creek. Creek overlook puts visitors over the creek on an observation deck to experience the water from afar. For those who would like a closer look, the Cattail Cove inlet, brings part of the creek inland. Visitors may closely

observe the happenings in the water from secure decking around the edge of the cove. Educational signage about the watershed, and its plant and animal communities add opportunities for visitors to develop a more intimate knowledge of their environment.

Sunny Field

Themes Addressed: Sensory, Navigability, Predictability, Variety

Figure 60. Relax In the Sun. Source: Ada, 2023

Zooming in closer, Sunny Field introduces a contrast to the excitement of the park hub facilities with landscape features inspired by nature play (*Figure*. 60). The sun mounds, placed in the open to catch the optimal amount of rays, bring playful topography with an open-ended variety of uses. One may perch upon the top with a good book, lean against it while people watching, roll down them, or stroll through the miniature labyrinth they create. Across the way, the hammock nook provides enough posts for four park goers to hook up their own hammocks for a peaceful sway.

These spaces flank an open grass field, perfect for dribbling a soccer ball or laying out a picnic. The field's low-profile maintains a site line across the entire space, making it easier to take in the activity from either of the surrounding paved main trails.

Meadow

Themes Addressed: Sensory, Navigability, Predictability, Variety

Figure 61. Hanging Out in the Meadow. Source: Ada, 2023

Next along the trail is the meadow. Boasting a community of native grasses and perennials, this landscape provides interest for pollinators, beneficial insects, and other wildlife while also bringing a beautiful palette of color and texture. This landscape is designed to primarily observed with the only true interaction point being one path through it. Basket swings (*Figure*. 61) along the southern edge of the meadow act as swaying observation spots for the meadow ecosystem throughout the

year. In addition to consideration based on ecological value, the planting palette in this space will be chosen for height as well. Similarly to Sunny Field, lower planting is prioritized to maintain sightlines across the meadow as not to convolute visitors' sense of the space and what is around them.

Woodland

Themes Addressed: Sensory, Variety

Figure 62. Woodland Area. Source: Ada, 2023

Entering the most nature immersive space, the Woodland shelters visitors under a full canopy. To ensure that the sightlines and landscape predictability is maintained, the trees nearest the main trail have their branches pruned up or are selected for high-branching quality. In this more dense landscape, it is important to reduce mystery around spaces, like the main trail, where visitors need the ability to navigate and understand what is coming next. A system of secondary pathways weave into the forested area. With the area being more naturalized, the paths are paved with resin-

based stabilized material so that the trail edges remain defined across season and as vegetation grows around. Small rooms dot the path, including a birding observation deck and a story circle, all conducive to different scales of gatherings. At the very end of the main trail loop is the woodland pavilion. It acts as a destination, shelter, and a checkpoint in the trail. This pavilion bookends the loop with the headhouse gateway. When visitors reach this pavilion they know they have hit the halfway point in the full main trail loop.

Places Away

Themes Addressed: Sensory, Variety

Figure 63. Places Away. Source: Ada, 2023

Places away are added throughout the park. Many are overtly areas dedicated to respite. Others are as simple as a bench along the trail. For park goers who need time and space away from stimulating environments, the places away give them a chance to recenter. These places can be found along the main trail, providing a moment to

pause if visitors are familiarizing themselves with the park landscape. In addition, each area of interest in the park has one place away within viewing distance (*Figure*. 63). This ensures that visitors who do need to distance themselves from high activity, such as sporting events, may still passively participate in the activity.

Figure 64. Places Away Integrated Within the Site Plan. Source: Ada, 2023

Know the Lay of the Land

Themes addressed: Navigability, Clarity, Predictability

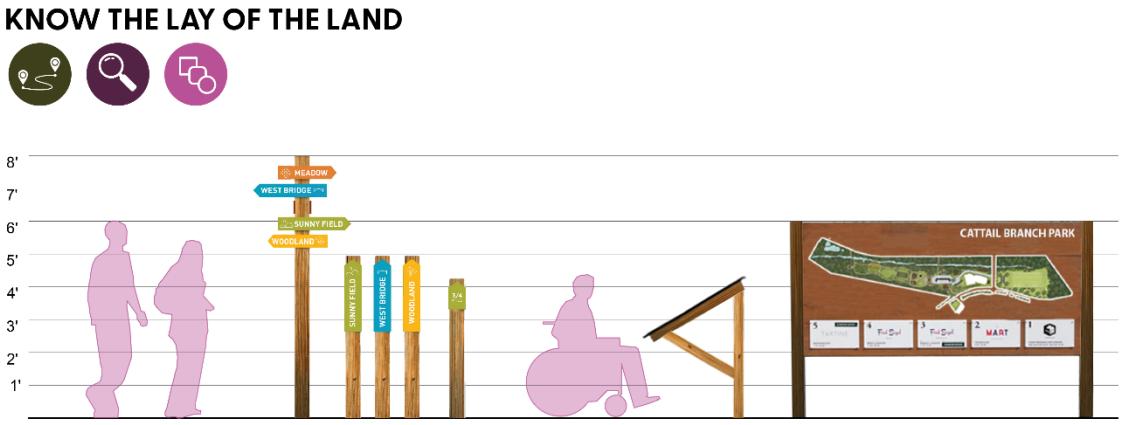

Figure 65. Wayfinding Concepts for Cattail Branch Park. Source: Ada, 2023

A quality wayfinding system is key to understanding a large park space, especially when encountering the landscape or parts of the landscape for the first time. The wayfinding signage and posts are themed similarly to the gateways structures to reinforce the visual themes associated with being in the space. Directional signage,

distance markers, and destination signage in Cattail Branch Park communicate through written descriptions as well as through visual cues like color and iconography. Educational signage is placed in the sensory garden, at the creek interaction areas, and near the meadow and woodlands. Educational signage acts in a few ways: as a preparedness tool for spontaneous encounters with the environment and wildlife, and as tools to help visitors build a relationship with the local environment. Finally, park directories with area descriptions are located at every entrance of the park for visitors to know up front what is within the space (*Figure*. 65). This communicative landscape helps people move independently within the park and makes it easier to arrive at their intended destinations.

Chapter 5: Discussion

The primary goal of this thesis project was to find and apply design strategies to create more comfortable and equitable experiences for adults with ASD in recreational landscapes. The secondary questions that helped address this goal asked what design guidelines for ASD existed and if they could be translatable to landscape architecture. A public park setting was the chosen setting to answer this question. The design guidelines from allied professions broke the ASD experience into different scales that were applicable to the site. The *Six Feelings Framework* provided masterplan-level interventions with particular influence on the infrastructure systems around the site. For the general population of adults, the ability to be mobile and go to destinations of interest is influential in feelings of self-determination and quality of life. Making multiple systems of transportation more intuitive, safe, legible, whether it be active transportation or public transportation, can greatly impact the experience of autistic adults when it comes to participating in recreational spaces. Magda Mostafa's *ASPECTSS Design Index* emphasized design of spatial organization at the site-scale for this project. The relationship of spaces should be informed by the sensory qualities, activities, and intended functions. With this strategy, landscapes become more predictable and clear for people with ASD. Vogel's *8 Design Standards* provided an interior design perspective, looking at the materials- and aesthetics-level of design. Visual identity, reduction of visual clutter, and calming materials inspired the use of a common architectural and aesthetic language for the gateway structures, pavilions, and wayfinding systems in the park that establish a recognizable identity in the space. Vogel's work, along with the feedback from the focus group, also informed

the wayfinding system and communication tools in the park. Finally, the Gaudion and McGinley's design guidelines for outdoor environments brought it together by discussing the role that outdoor environments can play in the lives of adults with ASD. Their work applied familiar themes from other design guidelines to a small scale landscape. The built environment professions often inspire each other with new perspectives and ideas, and that is exemplified in this project. The evidence-based design guidelines that exist today are applicable to landscape architecture and can help the landscape architecture profession create better recreational spaces for the growing population of adults with ASD.

Limitations

The time constraint of a year limited the design depth of this thesis project. A thorough design for this target population would require a deeper investigation into materiality, planting design, furnishing design, and wayfinding design. The timeline also limited community engagement. The conducted focus group was a major piece of the early design development. A second focus group conducted as a midpoint review with the same participants to corroborate or challenge the design would have been helpful to reinforce the design. Another limitation was the focus group size, age range, and support levels. The three self-advocate participants were all men in their 20's, who were living independently. While their perspectives were extraordinarily valuable, the project is missing perspectives from women, adults 30 years or older, and people with other support needs.

What Comes Next?

The limitations for this project create a launching point for future exploration. A necessary next step would be continued engagement with the Autism Community to substantiate this project's design decisions. If moved into construction details, collaboration with horticulturalists and subcontractors would be ideal to create a comprehensive expert-guided plant, furnishing, and materials palette. If the design is implemented, a post-occupancy evaluation specific to the project's design themes may be the next step to developing design guidelines for autism-friendly public park design. Overall, expanding on the findings of this thesis and furthering research into the relationship between adults with ASD and the landscape is needed.

The Future of Design

As evinced by ASLA's 2019 publishing of expanded universal design principles, inclusive design is the future of landscape architecture. Landscape architects are broadening who is considered stakeholders of the public spaces that they design. To reiterate, people with limited mobility, blindness and low vision, deafness and hardness of hearing, neurocognitive disorders, neurodevelopmental and/ or intellectual disabilities were all highlighted in ASLA's universal design principles as participants in the public realm. The body of research is continuously growing and providing landscape architects with a foundation for evidence-based design that welcomes people with various abilities and support needs. Overlap can be seen between design recommendations for ASD and design recommendations for other groups included in the ASLA design principles.

Multimodal communication signage and intuitive wayfinding benefits, for example, the aging population and people who are low-vision or blind, hard-of-hearing or deaf, and people with dyslexia and other learning difficulties. Areas for respite or transition into new environments benefit people with mobility challenges, people who are pregnant, and a range of physical abilities. Landscape legibility benefits people with Alzheimer's, people with learning difficulties, and people who are low-vision as well (Manley, 2016). Arguably, these design recommendations along with others such as wider pedestrian walkways, low- and high-sensory areas, safer streets, sheltering from elements, and variety of activities create more comfortable, enjoyable outdoor experiences for the general population. Landscapes specifically designed through the lens of the ASD experience make up a small yet mighty list. There is a case for implementing more landscape design decisions that benefit people with ASD. In doing so, landscape architects can be better advocates for inclusion and consideration for the nuances of humanness in the built environment.

Conclusion

Over the years, it has become clear that the Autism Community makes up a considerable portion of the population, many of whom have reached or are close to adulthood. Knowing that, this thesis argues that the Autism Community, adults in particular, are stakeholders in public park space. Through thoughtful layout, organization, signage, and site features, landscape architects can create welcoming environments for adults with ASD to experience positive well-being benefits associated with nature, lending to better quality of life outcomes. Overall, if landscape architects continue to design through the lens of ASD or make design

decisions inspired by better design for ASD, they can ultimately create better park environments for the general population.

Appendices

Plant Inventory around Palmer Park Community Center

PLANT SCHEDULE

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENT
WO	7	QUERCUS PHELLOS	WILLOW OAK	B&B	3"-3-1/2" CAL. 12'-14' HT.	MATCHED SPECIMENS
AR	5	ACER RUBRUM	RED MAPLE	B&B	3"-3-1/2" CAL. 12'-14' HT.	MATCHED SPECIMENS
Ccc	2	CORNUS FLORIDA 'CHEROKEE CHIEF'	CHEROKEE CHIEF DOGWOOD	B&B	10' - 11' HT.	
Cf	2	CORNUS FLORIDA	WHITE FLOWERING DOGWOOD	B&B	10' - 11' HT.	
Ck	1	CORNUS KOUSA 'KOUSA DOGWOOD'	KOUSA DOGWOOD	B&B	10' - 11' HT.	
Ic	33	ILEX CRENATA 'GREEN LUSTER'	JAPANESE GREEN LUSTER	3 GAL	18" - 24" HT.	
Ig	18	ILEX GLABRA 'COMPACTA'	COMPACT INKBERRY	3 GAL	18" - 24" HT.	
Jc	22	JUNIPERUS CHINENSIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	3 GAL	18" - 24" HT.	
Js	11	JUNIPERUS CHINENSIS 'SARGENTII'	SARGENT JUNIPER	3 GAL	18" - 24" HT.	
Jw	23	JUNIPERUS CHINENSIS 'WILTONI'	WILTONI JUNIPER	3 GAL	18" - 24" HT.	
Li	6	LAGERSTROEMIA INDICA 'TONTO'	TONTO CRAPE MYRTLE	B&B	10' - 11' HT.	3-STEM MINIMUM
Pl	21	PRUNUS LAUROCERASUS	SCHIPKA CHERRY LAUREL	5 GAL	24" - 30" HT.	

BIORETENTION AREAS PLANT SCHEDULE

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENT
Aa	17	ARONIA ARBUTIFOLIA	RED CHOKEBERRY	CONT.	3 GAL.	
Cs	35	CORNUS SERICEA	RED-OSIER DOGWOOD	CONT.	3 GAL.	
Ig	25	ILEX GLABRA 'COMPACTA'	COMPACT INKBERRY	CONT.	3 GAL.	
Sp	15	CLETHRA ALNIFOLIA	SWEET PEPPER BUSH	CONT.	3 GAL.	
Pv	1099	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	CONT.	1 GAL.	SPACE 24" O.C.

Figure 66. Plant List From PPCC Construction Documents. Provided by MNCPPC

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