

Prospectus

Guiding the Design of Ground Surface Material for an Inclusive Playground

(Technical Topic)

Technological Politics & Exclusion of Users through Standard Playground Design

(STS Topic)

By

Reid Auchterlonie

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Technical Project Team Members: Chloe Brannock, Victoria Jackson, An Luong, Kiley Weeks

On my honor as a University student, I have neither given nor received aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: Reid Auchterlonie

Approved: _____ Date _____

Ben Laugelli, Department of Engineering and Society

Approved: _____ Date _____

Rupa Valdez, Depart of Engineering Systems and Environment

Sociotechnical Problem

The Charlottesville area lacks an inclusive park where all members of the community can participate in leisure and play activities. Bennett's Village is a local organization working to bring awareness of inclusive design to the community, as well as, constructing an inclusive playground for people of all abilities and ages (*About – Bennett's Village*, 2018). My capstone team joined Bennett's Village to help design a new inclusive playground at Pen Park in Charlottesville.

Although many playgrounds are Americans with Disabilities Act (ADA) compliant, the materials and equipment used for the playground surfaces are not conducive to people with varying degrees of mobility and/or impairments (Fernelius, 2017). Playground surface materials are a key component to creating an inclusive playground, as they impact the physical capability of a user maneuvering through the space. My team will recommend an alternative ground surface material that will adequately address user needs for the new inclusive playground at Pen Park.

However, physical exclusion of users created by current park design is not the only factor to consider, playgrounds and parks also fail to be inclusive on a social basis. Furthermore, a portion of the population is being excluded and marginalized from these communal spaces. Parks have an immense impact on individuals through increasing physical activity which helps maintain fitness and health, as well as enhances psychological well being (Gies, 2006). By excluding groups of users through park design, the community is taking away these important benefits from them. Playgrounds don't merely serve a technological role, they also play a role in community power dynamics and intrinsically cause inequality among the community. The social and technical aspects of this project need to be addressed to adequately design an inclusive playground, otherwise, these communal spaces will continue to further a divide in the

community. By only addressing the technical aspect of the project, readers don't gain the understanding that playground design has deeper impacts than the physical exclusion of a group of people. Moreover, it is important to understand the social power dynamic playgrounds perpetuate in surrounding communities.

The playground space is socio-technical in nature and requires attention to both the technical and social factors that are created by and maintained in this communal space. Parks and playgrounds are community centers which can unintentionally and negatively shape the power dynamic of the community by benefitting particular users while marginalizing others if the designer neglects to understand and incorporate the social and political natures of playground design. I will use the STS framework Technological Politics to analyze how playground design can disenfranchise users, particularly those with disabilities. In addition, my capstone team and I will develop a ground surface material recommendation for Bennett's Village for their new inclusive park. The ground surface material will maximize design criteria that includes: ease of usability for various modes of mobility, safety, durability, maintenance, cost, and environmental impact of the material in an effort to increase inclusivity of the park and fulfill the needs of the community.

Technical Problem

Public parks and playgrounds today must follow guidelines set forth in the Americans for Disability Act Accessibility Guidelines (ADAAG) (*Accessible Play Areas*, 2005). In these guidelines there is a small section devoted to "Accessible Ground Surfaces" which explains that playground surface materials must abide by ASTM F 151-99 standards. These standards determine if a surface material is accessible "...by measuring the work an individual must exert

to propel a wheelchair across the surface” (*Accessible Play Areas*, 2005, p.22). These regulations are what guide and structure the design of playgrounds in the United States. However, they are not very extensive and, in general, address issues of accessibility rather than inclusivity (Ofiesh & Poller, 2018). Today, an organization called Bennett’s Village is going beyond ADA standards by “... working to build a multigenerational, all abilities playground here in Charlottesville and advocating to change the way our community sees inclusion” (*About – Bennett’s Village*, 2018).

Parks and playgrounds have been around for centuries and the surface materials typically used for these facilities are standard materials like pea gravel, sand, wood chips (mulch), and shredded rubber. These materials are widely used, well-known, safe, and are perceived as accessible. Due to their establishment in the playground realm, these materials are typically selected for playground designs (Marshall, 2011). However, these classic materials, used at many parks and playgrounds today, make it near impossible for people with disabilities, like those who have limited mobility, to navigate the playground floor area. Loose fill surface materials like sand, shredded rubber, and wood chips are difficult to traverse for people with varying modes of mobility and, therefore, now aren’t typically recognized as ADA-approved materials (United States Consumer Product Safety Commission, 2018). Further, if a person with disabilities is capable of using these types of playgrounds with loose fill surfaces, they typically need help and are not able to independently play (Yantzi et al., 2010).

If the design of playgrounds are addressed in terms of material selection, the community will gain a space where people of varying abilities and age can play. The goal of this project is to determine a playground surface material that goes beyond the minimum ADA compliance requirements and is suitable for people of all abilities and varying ages through analyzing various characteristics including: usability for various modes of mobility, impact and safety ratings,

durability, maintenance, cost, and environmental impact. These goals will help meet community needs by ensuring not only accessibility for, but also inclusivity of playground users of all abilities. The playground surface material will utilize a cost benefit analysis, including all the prioritized characteristics listed above, to determine the optimal material to maximize inclusion. Literature review on existing and potential playground surface materials that focuses on the material's impact analysis, required maintenance, durability, color and texture variety, ease of installation, cost, availability, and chemical makeup, as well as, interviews with surface material professionals will be used as a means of data collection. This data will then be analyzed to determine the optimal material recommendation.

STS Problem

In 2019, the City of Charlottesville was estimated to have around 47,266 people with 6.3% of these people, under the age of 65, having disabilities. Therefore, in the City of Charlottesville there are around 3,000 disabled residing community members (*U.S. Census Bureau QuickFacts*, 2019). However, this statistic is not entirely representative of the number of people with disabilities living in Charlottesville. The prevalence of disability increases with age, therefore, there are a significant portion of people above the age of 65 who have disabilities. In addition, people who have chronic illnesses and/or temporary disabilities who do not identify as disabled are not counted in the statistics provided by the City of Charlottesville.

A spatial audit of the City of Charlottesville playgrounds was conducted through the University of Virginia's School of Architecture to establish a baseline understanding of how well the playgrounds in Charlottesville are catering to the needs of the community, particularly people with disabilities (Jiang et al., 2018). The spatial audit case study looks at 20 public parks within

and owned by the City of Charlottesville. The City of Charlottesville has policies regarding park facilities goals, one of which strives to “guarantee parks and recreation facilities are available for the benefit of all city citizens” (*Business Activities Licenses / Charlottesville, VA*, n.d.). The spatial audit of Charlottesville playgrounds shows that “city parks inadequately serve the limited mobility community and prevent opportunities for children of all abilities to come together and play” (Jiang et al., 2018, p.4). These findings contribute to the notion that the City of Charlottesville views playgrounds as technologies that serve the role of providing a space for play, and do not also view playgrounds as social and political spheres.

The City of Charlottesville has a plethora of parks and playgrounds, yet has failed to achieve its mission of benefiting all of its citizens. The Charlottesville community is tremendously lacking in a truly inclusive playground. In addition, the City of Charlottesville currently considers playgrounds as merely a technology and ignores the fact that playgrounds also play an important and powerful political role. If the City of Charlottesville operates its parks as is, a portion of the community will continue to be physically and socially excluded from communal spaces, whether unintentionally or not, and the political role of parks will be ignored. Only able bodied people are able to reap the social, mental, and physical benefits of the Charlottesville parks, while those with disabilities are left empty handed due to playground design (Jiang et al., 2018). Even further, if this excluded group of users would like to engage in play, the nearest truly inclusive playground, Soar365, is located over an hour from Charlottesville (Jiang et al., 2018).

Using the science, technology, and society (STS) framework technological politics, I argue that the Charlottesville playgrounds do not merely serve as a play space, but they have a political role that shapes community power relations by privileging able bodied users and

marginalizing users with disabilities. As pointed out in the framework Technological Politics, it is important to consider how technologies typically don't only serve their technological purpose, but also have the capacity to structure and feed power dynamics (Winner, 1980). It is important to realize that these public spaces that are supposed to cater to the community as a whole actually neglect a proportion of the population. These neglected people have no local alternative play space and are socially, mentally, and physically negatively affected by the lack of facilities provided by the community (Skulski et al., 2013). I will use technological politics to examine how, even though parks may not have been intentionally designed to be exclusive, the standard playground design marginalizes users by catering to only a subset of the population. This framework will help expose the power dynamics involved with public parks and playgrounds and potentially unveil mechanisms to equalize the power among particular user groups. It is especially important to review the technological politics in regards to playgrounds and parks since the majority of users are young children that unknowingly developmentally benefit from playground experiences.

Further research using the STS framework Technological politics will help determine which ways able bodied users are benefitting from parks and playgrounds, while people with disabilities are being excluded. To understand the power roles created by standard park design, I will research the benefits of playgrounds on health and development and which specific playground components contribute to these benefits. As well as, I will research how current inclusive playground design has been successful in creating a unified community space and also ways in which they have failed to create equality and why. This research can help diminish exclusion of user groups in parks and in other public spaces by uncovering how to combat the social problem of excluding important community user groups in the Charlottesville area.

Conclusion

Guiding the design of an inclusive playground is a socio-technical problem by nature. It is important to consider the power relations shaped by standard playground design and how the marginalization of users with disabilities can impact members of the community and the overall community dynamic. Additionally, the technical design of the park in regards to materials selection can greatly affect the degree of inclusivity of the park by not fulfilling the needs of users of varying ages and abilities. Combining both the technical and social factors of park and playground design, the new playground at Pen Park in Charlottesville will have the potential to not only exceed the minimum requirements set by the government, but also fulfill the needs of the community to ensure the design and implementation of a communal park that is accessible to and inclusive of all community members. The technical and social aspects of inclusive design are complementary and must both be assessed and addressed to successfully cater to the needs of the community and ensure unintentional exclusion is avoided.

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