**Prospectus**

**Recommendations for the Design of an All-Abilities Playground**

(Technical Topic)

**Ensuring accessibility in high-traffic public spaces during the era of COVID-19**

(STS Topic)

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

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## Introduction

The city of Charlottesville is home to over two dozen parks and playgrounds. However, despite roughly 15% of the population being under 18 and boasting nationally-lauded children's hospital, there is currently no all-abilities family playground in or near the city. The local nonprofit Bennett's Village is working with the city to build its first ability-inclusive, multigenerational playground at the Pen Park recreation area. This technical project aims to better understand the needs of the local community who is within the disability space and provide recommendations on the design of a wheelchair track. If successful, Bennett's Village will have access to data-driven recommendations to better fit the playground to the needs of its eventual users and technical advice for the design of a mobility-inclusive play track.

Ensuring that public spaces remain accessible has become even more difficult in the era of COVID-19. Many mitigation strategies for the pandemic do not fully account for the needs of vulnerable populations such as children and people with disabilities, and access to green and natural spaces is more important than ever in a time of closed schools and other daytime facilities. This STS research paper seeks to provide practical solutions and recommendations for ensuring accessibility in high traffic public spaces in a pandemic and post-pandemic world by critiquing and expanding upon the currently emerging body of work describing strategies for COVID-19 containment. The paper will be written specifically within the context of recreation areas like those addressed in the technical project.

## Technical Topic

Bennett's Village is a nonprofit working with the city of Charlottesville to build the area's first all-abilities, multigenerational playground at the Pen Park recreation area (Bennett's Village, 2018b). The organization was founded by the parents and friends of Bennett

McClurken-Gibney, a local boy who passed away in early 2018. Despite the limitations on his mobility imposed by Spinal Muscular Atrophy type I, Bennett was an active child who loved to play. His family struggled to find local play spaces that were suitable for children in wheelchairs, with the closest all-abilities playground being PARK365 in Richmond. The nonprofit seeks to create a similar space in the Charlottesville area as part of Bennett's legacy (Bennett's Village, 2018a).

After consulting with key personnel at Bennett's Village about what would be most useful for advancing the project, our capstone team decided to focus on performing an assessment of local user needs for an outdoor recreation space. Applying for approval from the University of Virginia's Internal Review Board and creating a methodology for the former was the focus of the fall semester, and executing this study will be the focus of the spring semester pending IRB signoff.

The study will be conducted using semi-structured interviews and surveys with adolescent (ages 12-17) and young adult (ages 18-26) participant groups. Participants must have some relation to the disability space, whether they themselves have a disability or someone close in their lives has a disability. We are calling for interview volunteers and survey participants through community outreach emails and on social media. The team will analyze the collected data using qualitative content analysis and developing personas based on observed trends that Bennett's Village can use to effectively incorporate the voices of its future users in the project moving forward.

For the interview, which will be conducted over Zoom, participants will be asked a series of questions regarding their personal activities/hobbies, experiences with recreational play activities, playground design impacts, playground feature preferences, and demographic

information. For the survey, participants will be asked a series of questions regarding their playground experience, frequency of playground visits, playground feature preferences, and demographic information. The survey will be formatted and administered using Qualtrics, the approved survey software by the University. All interview participants will receive a $20 gift card, and all survey participants will be entered into a raffle to receive a $100 gift card. The interview and survey questions are currently under review by the IRB and have already undergone several rounds of editing.

Our team also hopes to provide recommendations for the design of mobility-inclusive play track. This track is still in the very early stages of design, but the intention is to simulate a feeling of freedom and flight for wheelchair users, potentially through the use of gravity and momentum. Our primary focus will be making recommendations for how the track can best accommodate different modes of traffic (such as visitors with mobility aids or visitors that may need extra fall protection) while accounting for practical and logistical specifications such as maintenance/upkeep, sustainability of materials, durability, cost, and aesthetics.

**STS Paper**

This STS paper will examine potential solutions and recommendations for ensuring accessibility in high-traffic public spaces in a pandemic-conscious society through the lens of the Social Construction of Technology (SCOT) theory. Guidelines for a safe return to normalcy after the COVID-19 pandemic are in their early stages, but I believe that their success will be as dependent on the public's perception of their safety as their empirical effectiveness. Through analysis of the societal attitudes and methods of countries with different degrees of success combating the spread of COVID-19, I hope to determine methods that will improve acceptance of coronavirus guidelines and mitigation efforts, which I will also be developing a framework for

to ensure that the needs of vulnerable populations such as children and people with disabilities are effectively incorporated into these strategies.

The utilization of a space is reliant on the users' perception of trust and a commonality in goals (James, 2020). To be more specific, the *perception* of the safety of an environment is almost as important as the empirical effectiveness of measures taken to ensure safety. This is supported by the primary claim of SCOT theory that technology is driven by human action, therefore advances in technology and safety can only be made so far as societal perception allows them too. I plan to contrast the responses and societal attitudes of countries with a similar level of technological advancement such as New Zealand, the United States, and South Korea to demonstrate the role of societal attitudes in effectively combatting the pandemic as a case study in SCOT theory. Because the countries of interest have a similar standard of living, factors besides access to technology must have an impact on the success of their response to COVID-19, and I intend to demonstrate that societal factors such as the role of collectivism vs individualism and attitudes towards government are among the driving factors. Once I have isolated these factors, I hope to be able to come up with recommendations for design and policymaking that better fit the needs of countries like the United States that, despite our access to technology and high standard of living, have floundered in efforts to contain the virus.

For example, many of the most successful countries in terms of pandemic response have demonstrated decisive leadership (Forman et al., 2020). To contrast two at a basic level, the responses of the South Korean and American governments to COVID-19 were both highly politicized and strongly nationalist, albeit in different political directions. The national South Korean response, though not without critique, had the strong message of stopping the virus at all costs, sometimes at the expense of personal freedoms (Yi & Li, 2020). Meanwhile, the national

American response was fractured in its messaging not only on containment methods but on the existence of the virus in the first place (Halpern, 2020). This failure of the American government to produce a unified response to the virus resulted in a patchwork public perception of COVID-19 that has prolonged the pandemic by months. Because both South Korea and the United States are the forefront of technology, especially in medicine, it is reasonable to conclude that differences in the public's perception of the severity of the pandemic resulting from a different intensity in response from the national governments contributed to the success of the former country in containing the spread of COVID-19 and the failure of the latter. Therefore, a basic recommendation for improving adherence to COVID-19 mitigation practices would be unifying behind a strong national message of the importance of stopping the virus. It may seem simplistic, but historical examples such as the so-called War on Terror demonstrate the power of a strong unifying message in shaping public attitude towards large-scale government intervention that was previously thought impossible.

Many potential mitigation strategies to COVID-19 rely on strict social compliance, such as the strategies of limiting close interpersonal contact, interaction with high-touch surfaces, and large gatherings (Razani et al., 2020). While among the most effective strategies, it can be harder to ensure compliance from populations such as children or people with disabilities (Hashikawa et al., 2020). I have chosen these populations are my focus because their needs, especially those of the intersectional population of disabled and chronically-ill children, are often considered secondarily to those of an able-bodied adult population. Additionally, comorbidity is a major factor in COVID-19 survival rates, therefore accounting for the needs of the disabled and chronically ill community is paramount. Finally, while children only comprise 1.7% - 2% of diagnosed cases of COVID-19 and children appear to experience less severe symptoms than the

general population (Tsabouri et al., 2021), much of this data has only emerged in the past year. As schools begin to physical reopen, we may see increased complications and transmission rates among children, so having effective methods for engaging children in pandemic mitigation measures is important for preventing a second wave.

**Timeline and Expected Outcomes**

The anticipated final deliverables of the technical project are an analysis of local user needs for an all-abilities multigenerational playground, recommendations for the design and material composition of a mobility-friendly play track loop, and a paper to be considered for presentation at the 2021 Systems and Information Engineering Design Symposium (SIEDS). Pending approval by the Internal Review Board, we expect to deploy our survey and complete interviews within the next two to three months, analyze and compile aggregate data throughout the semester, and complete our paper for SIEDS by the beginning of April. We will submit our SIEDS abstract by the end of February at the latest. We hope to turn our findings in a more directly useful form (still-to-be-determined) over to Bennett's Village by the end of the semester.

For the STS research paper, I hope to develop recommendations for the inclusion of vulnerable populations in planning COVID-19 mitigation strategies as well as make predictions on their effectiveness using a SCOT-driven analysis country response to the pandemic. Because people with disabilities and children have an increased and not well understood COVID-19 death and transmission rate, respectively, accounting for their needs in pandemic containment plans is essential for protecting all of society from an unintended secondary tertiary spike of the pandemic. Additionally, examining the failures in societal attitudes that led to less-effective mitigation strategies in the United States will better prepare the country for future national emergencies of this scale.

## References

Anthes, E. (2020, April 11). Building playgrounds that get kids moving. Science News, 197(7), 20 - 24. http://search.ebscohost.com/login.aspx?direct=true&db=cmh&AN=142419339&site=chc-live

Bennett's Village. (2018). *Bennett's Story.* https://bennettsvillage.org/bennetts-story/

Bennett's Village. (2018). *Mission and Vision*. https://bennettsvillage.org/about/mission-vision/

Forman, R., Atun, R., McKee, M., & Mossialos, E. (2020, June 1). 12 Lessons learned from the management of the coronavirus pandemic. Health Policy, 124(6), 577 - 580. https://doi.org/10.1016/j.healthpol.2020.05.008

Halpern, L. W. (2020). The Politicization of COVID-19. AJN, American Journal of Nursing, 120(11), 19–20. https://doi.org/10.1097/01.naj.0000721912.74581.d7

Hashikawa, A. N., Sells, J. M., DeJonge, P. M., Alkon, A., Martin, E. T., Shope, T. R., ... DeJonge, P. (2020, October 1). Child Care in the Time of Coronavirus Disease-19: A Period of Challenge and Opportunity. Journal of Pediatrics, 225, 239 – 245 https://doi.org/10.1016/j.jpeds.2020.07.042

James, A. C. (2020, June 17). Don't stand so close to me: Public spaces, behavioral geography, and COVID-19. DIALOGUES IN HUMAN GEOGRAPHY, 3. https://journals.sagepub.com/doi/pdf/10.1177/2043820620935672

Pocock, L., & Shams, R. (2020, September 1). The post Covid world: architecture, internal spaces, public spaces and streetscapes. Middle East Journal of Business, 15(3), 20 - 25. https://doi.org/10.5742MEJB.2020.93871

Razani, N., Radhakrishna, R., & Chan, C. (2020, August 1). Public Lands Are Essential to Public

Health During a Pandemic. Pediatrics, 146(2), 1 - 3. http://dx.doi.org/10.1542/peds.2020-1271

Slater, S. J., Christiana, R. W., & Gustat, J. (2020, July 1). Recommendations for Keeping Parks and Green Space Accessible for Mental and Physical Health During COVID-19 and Other Pandemics. PREVENTING CHRONIC DISEASE, 17, 4. https://doi.org/10.5888/pcd17.200204

Thompson, D., Hudson, S. D., & Bowers, L. (2002, February 1). Play Areas and the ADA: Providing Access and Opportunities for All Children. JOPERD: The Journal of Physical Education, Recreation & Dance, 73(2), 37 - 41. https://doi-org.proxy01.its.virginia.edu/10.1080/07303084.2002.10607752

Tsabouri, S., Makis, A., Kosmeri, C., & Siomou, E. (2021, February 1). Risk Factors for Severity in Children with Coronavirus Disease 2019: A Comprehensive Literature Review. The Pediatric Clinics of North America, 68(1), 321 - 338. https://doi.org/10.1016/j.pcl.2020.07.014

Yi, J., & Lee, W. (2020, August 1). Pandemic Nationalism in South Korea. Society, 57(4), 446 - 451. https://doi-org.proxy01.its.virginia.edu/10.1007/s12115-020-00509-z