Getting to the Park : Identifying Disparities in Greenspace Access

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Abstract

Our team, composed of 5 undergraduate student from the Environmental Studies program at the University of Cincinnati, measured the quality and safety on two separate walking paths that lead to Burnet Woods: one from Rockdale Academy and one from The Fairview-Clifton school. Team members identified and classified the flora found of these walking paths. Our team also conducted a level of safety test on the walking paths and reviewed institutional history. The team concludes that both paths are relatively unsafe, but a severe disparity exists between the two paths due to unsafe walking conditions, unequal distances and urban sprawl.

Introduction

Public greenspaces are vital to humans' wellbeing. Greenspaces improve physical and mental health, safety, and happiness to people that use them (Engemann, 2019). This study aims to uncover disparities within socioeconomic boundaries of urban neighborhoods, focusing on elementary students' accessibility to a shared greenspace.

When looking at major cities across the United States, there is a clear correlation between tree canopy cover and median household income (Riley, 2020). However, race does not necessarily correlate with tree canopy cover (Schwarz, 2015). There are few existing studies researching walking paths between schools and greenspaces, but there are many that compare walking between home and school, one of which found that wealthier neighborhoods had easier and more enjoyable walks (MacDonald, 2016).

In our community, we are in a unique position to study accessibility to green space between schools of two socioeconomic statuses due to their similar distance between Burnet Woods. Measuring both safety and quality of green space between the two walking paths, the path from Fairview-Clifton German Language School will be of higher quality in both regards compared to Rockdale Academy.

By comparing the walking paths of the two schools to Burnet Woods, we hoped to add more understanding to how greenspaces near schools could impact students' lives.

Method

Using iNaturalist, our team sampled flora along each path from Burnet Woods to each school in September 2020. The team observed substantial landmarks along the path, including the Cincinnati Zoo, the University of Cincinnati, and Cincinnati Children's Hospital Medical Center. A review of historical changes to Burnet Woods was also included. Socioeconomic data for each school was compared using data available from the Ohio Department of Education. Each of the walking paths were measured for distance, time, and number of intersections crossed using Google Maps. An analysis of pedestrian accidents was conducted using the City of Cincinnati Traffic Crash Report. Additionally, Pedestrian and Bicycle Level of Service (BLOS/PLOS) was used to calculate for both paths. The assessment is a qualitative measure based on multiple conditions, including speed, traffic volume, sidewalk width, and sidewalk buffers. The grading system uses an A-F scale. The grade range is calculated using the following scale: A x ≤ 2.00, B 2.00 < x ≤ 2.75, C 2.75 < x ≤ 3.50, D 3.50 < x ≤ 4.25, E 4.25 < x ≤ 5.00, F x >

Results

Demographic data for this study shows considerable differences in socioeconomic status between the two schools. In Figure 1, the graph shows 89% of Rockdale Academy students are enrolled in the Free or Reduced-Price Lunch program. 27% of Fairview-Clifton students are enrolled in the income-based program (Ohio Department of Education, n.d.). Figure 2 depicts differences in ethnic makeup between the two schools.
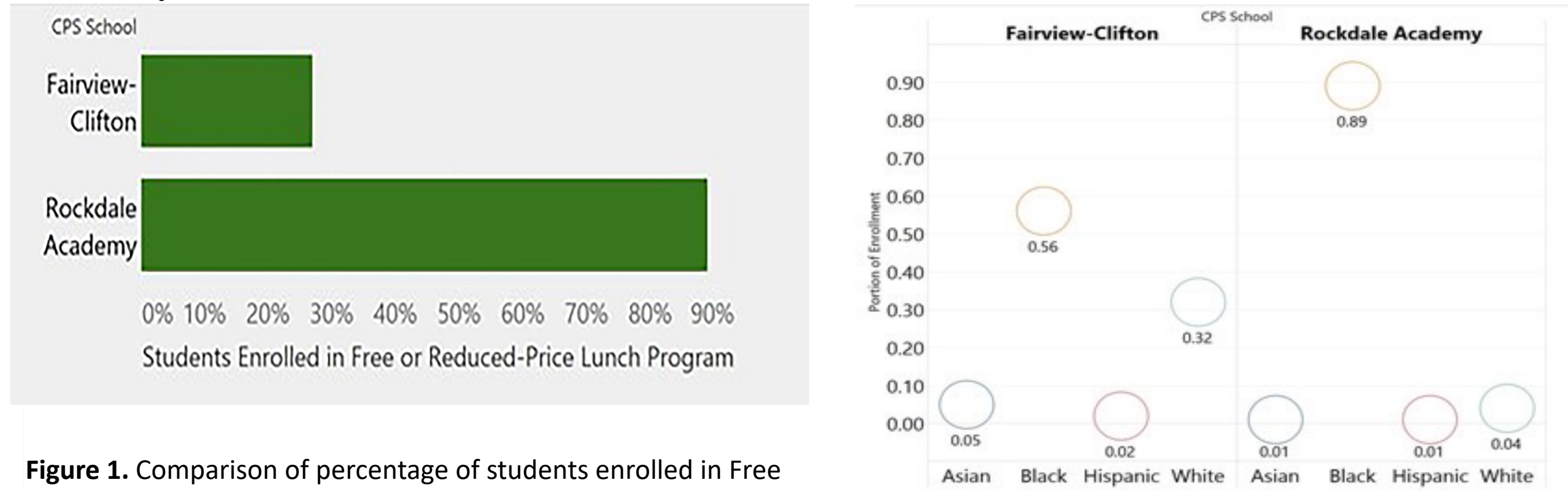

Figure 1. Comparison of percentage of students enrolled in Free or Reduce-Price Lunch Program for both schools.

Figure 2. Comparison of ethnicities for both schools.

Time and distance between the schools and Burnet Woods is shown in Figure 3, Rockdale students walk an extra 19 minutes and one mile further to access Burnet Woods compared to students at Fairview-Clifton School.

Safety analysis of the two paths show Rockdale's path crosses over four more intersections compared to Fairview-Clifton's path. Since 2013, the route between Fairview-Clifton and Burnet Woods experienced one additional pedestrian accident compared to Rockdale's route (Traffic Crash Report, nd).
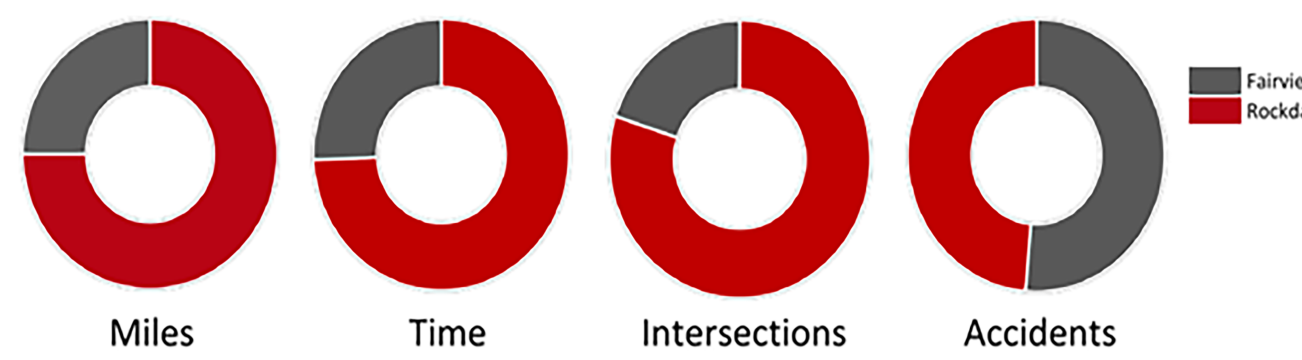

Figure 3. Miles, time, intersections crossed and number of pedestrian accidents for both schools.

Accommodations for biking and walking were analyzed using the Bicycle and Pedestrian Level of Service (BLOS/PLOS). As shown in Figure 4, the Fairview-Clifton route shows a result of a grade C. Rockdale's path received a D grade.
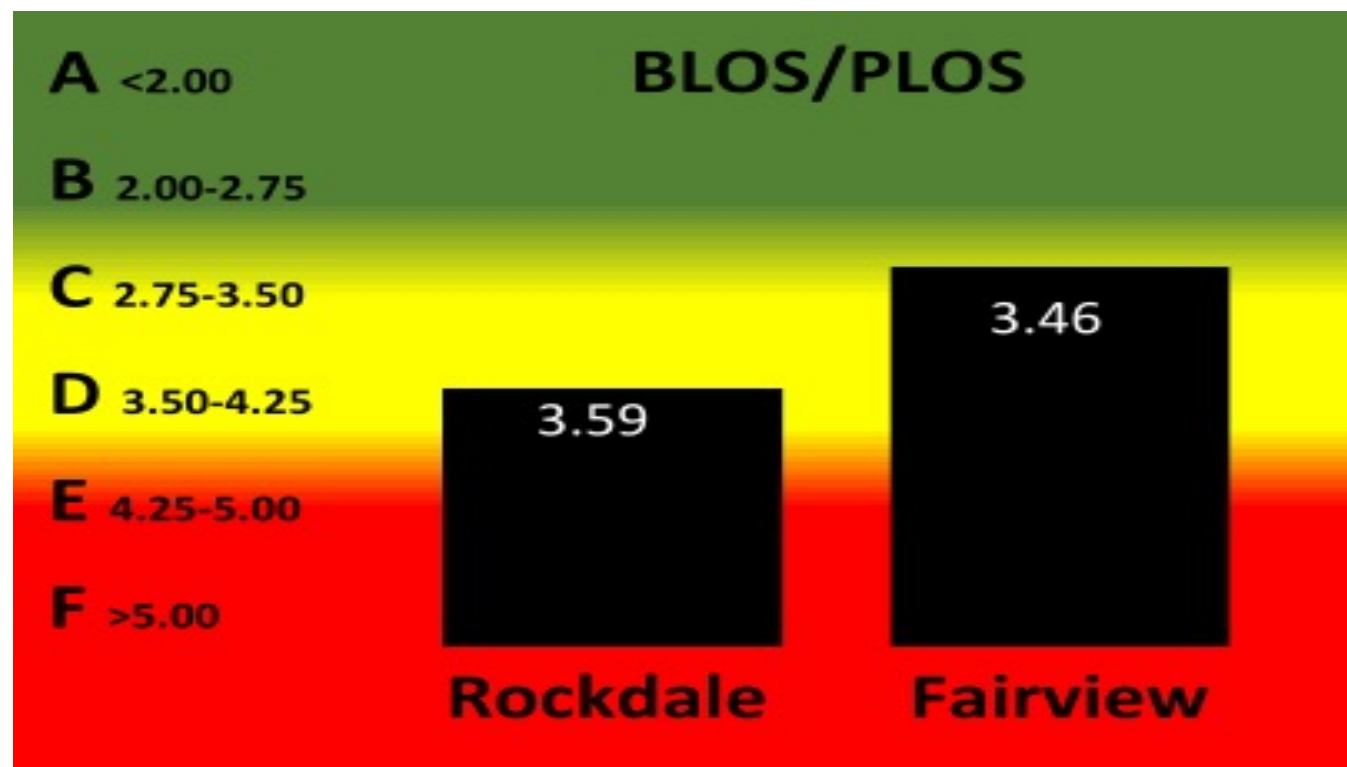

Figure 4. BLOS/PLOS Assessment Comparison

Figure 5. Vegetation comparison of both paths

Vegetation analysis for this study is inconclusive. The information recorded is incomplete and not considered in the final analysis. Observations show Rockdale has 1.6 trees and Fairview-Clifton has 0.8 trees for every 100 feet, as seen in Figure 5. (iNaturalist, n.d).
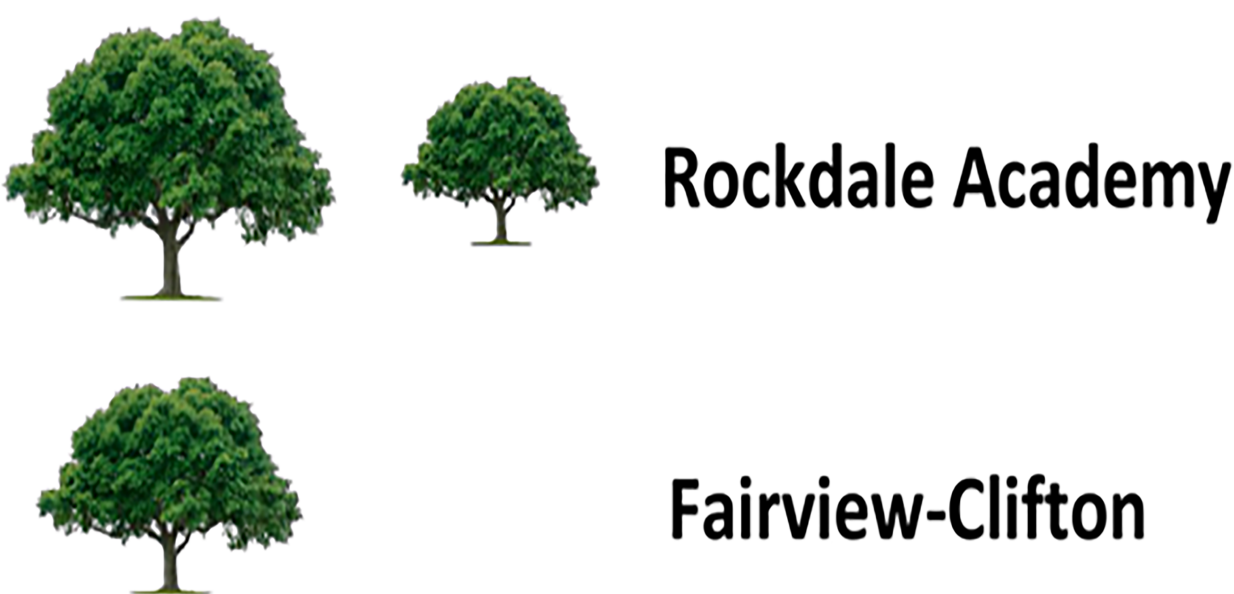
Burnet Woods is approximately 90 acres of green space in the heart of Cincinnati's uptown. The park was once a 170-acre park. In 1883, sections were sold to the University of Cincinnati for expansion purposes (Figure 6). Many of the University's building now occupy space that was once part of Burnet Woods.

Figure 6. Map of Burnet Woods in 1884

Discussion

Our team studied the safety and natural quality of the walking paths from two area elementary schools to Burnet Woods, hypothesizing that Rockdale Academy's path would score lower for both criteria. The background research carried out on the two schools demonstrates the economic disparity between Rockdale and Fairview, with almost 90% of Rockdale's students enrolled in the Free or Reduced-Price Lunch Program.

But, while walking the paths, a number of less measurable disparities surfaced: while Fairview sits among neighborhoods and churches, Rockdale and its walking path is shoved between three major institutions- The Zoo, UC, and Children's hospital- in the same way that Burnet Woods itself is. Ironically, the school is almost twice the distance from the park.

The comparable stats between the two paths are those dealing with safety. Fairview's path has had 19 pedestrian accidents along it since 2013, while Rockdale had one less. With two relatively low PLOS scores, it is clear the routes to Burnet Woods were not created with walkability in mind. Improving PLOS score of the paths, as well as expanding green space along them, would greatly improve accessibility for both schools.

Compared to Fairview's, Rockdale's path clearly scores lower in terms of walkability. However, both lack the safety and healthy natural environment that should be expected of a walking path. In order to expand access to it, green space cannot just be thought of as where nature is and is not: it is critical that we reimagine our community as one that houses both people and the unaltered environment and prioritizes both party's safety and ability to thrive.

Acknowledgments

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