

Greening in Rhode Island and Project G-SPACE

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ABSTRACT

This article (1) summarizes historical and present greening initiatives across Rhode Island, and (2) illustrates how Project Greenspace, Sleep Patterns, Activity Space, and Environment (G-SPACE) benefits from and builds upon this public health work.

KEYWORDS: Children; greenspace; community greening; sleep; mental health; physical activity

HISTORY OF GREEN INITIATIVES IN RHODE ISLAND

Tree planting and tree equity

Besides enhancing a city's physical beauty, urban forests reduce air pollution, provide natural stormwater management, and offer habitats for birds and pollinators.¹ The American Forests' "Tree Equity Score Analyzer" (TESA) determines the percentages of canopy cover across neighborhoods, and can be used by community organizations to promote tree equity, defined as the right number of trees for all community members to experience the health, economic, social, and other benefits of trees. There are several organizations that have historically engaged in greening initiatives in Rhode Island (RI), particularly Providence and the surrounding urban areas. One such organization is the Providence Neighborhood Planting Program (PNPP), started in 1989 with three goals: to plant street trees across the city, train residents to maintain plantings through a stewardship program, and instill the importance and value of trees and urban forests.² Over 16,000 trees have been planted and maintained in Providence as a result of the PNPP.² Another organization involved with greening initiatives is GroundworkRI, whose Tree Equity Initiative started in 2023, aims to plant 2,000 trees in low-canopy communities of Central Falls, Cumberland, Lincoln, and Woonsocket (GroundworkRI).³ This project continues the work of the previous Trees4US Pawtucket-Central Falls initiative, which planted 197 trees through the Pawtucket-Central Falls Health Equity Zone's Trees for Human Health grant.

Greening schoolyards

In addition to greening city streets, there have been several efforts to increase green spaces in schools. The Providence

Green Schoolyard Initiative is a collaboration between the City of Providence and community partners to transform schoolyards into vibrant green spaces that promote children's health and development.⁴ In 2022, Bailey Elementary School opened Providence's first green schoolyard.⁵ Another initiative is the Children & Nature Network (CNN), a collaborative focused on partnering with cities, including Providence, to enhance green spaces and outdoor learning opportunities; with over \$6 million invested from CNN, Providence has been able to develop a detailed action plan and implement green schoolyard renovations.²

PROJECT G-SPACE

How does Project G-SPACE relate?

Greening efforts by organizations like the PNPP and GroundworkRI have not only allowed for an increase in access to greenspaces by residents, but also enhanced the ability to research how greening efforts impact local communities. Project Greenspace, Sleep Patterns, Activity Space, and Environment (G-SPACE), from the Social Epidemiology (Epi) Lab out of Brown University's School of Public Health, is an ongoing study investigating how access to green space influences the sleep, mental health, and physical activity of elementary school children.⁶ Notwithstanding physical health benefits, few prior studies have explicitly examined the relationships between greenspace, sleep, and mental health. Since 2021, the Lab has worked with children and their families in an attempt to fully disentangle underlying mechanisms accounting for the associations between these critical pillars of overall health and well-being. Ultimately, we hope that findings from Project G-SPACE will provide further evidence to support intervention programs promoting green space access among school-aged children in RI, such as the greening efforts of the organizations already discussed, and serving on the study's advisory board.

Advisory board

The Project G-SPACE advisory board, composed of members from four organizations focused on creating healthier and more equitable communities, has served as a gateway to connecting with our community. In addition to GroundworkRI, the Rhode Island Healthy Schools Coalition (RIHSC) sits on the board. The mission of the RIHSC lies in making schools

across the state healthier by advocating for policies that promote nutrition, physical activity, and mental and emotional wellness for children.⁷ The City of Providence is also represented on the board,⁸ in addition to Thrive Outside, an organization based in Bristol with a mission of ensuring every child has the opportunity to access nature.⁹ The Project G-SPACE advisory board has provided invaluable guidance and strategic advice, and has assisted greatly with expanding our reach across Rhode Island and creating long-lasting community partnerships.

Community work

A key component to the success of Project G-SPACE lies with our community partnerships and their ability to spread awareness of this study to eligible families. The study team has had the privilege of collaborating with five public school districts and nine independent schools across RI, including schools in Bristol-Warren, Central Falls, Cranston, Johnston, Providence, and Newport. In total, public school districts have allowed Project G-SPACE to achieve a student reach of over 6,000, while independent schools have allowed for a student reach of over 3,500. Beyond the mission of G-SPACE, the Lab actively strives to give back to our school communities; one such example was a donation of protective sunglasses to several partnered elementary schools to watch the solar eclipse in April 2024.

In addition to schools, the Lab has been fortunate to collaborate with several other organizations across RI to inform the study protocol and recruitment strategy. The Lab maintains both a virtual and physical outreach presence in an attempt to reach and recruit families within the study demographic, tabling at local events throughout the year, such as farmer's markets, and running radio and social media advertisements. The Lab has also formed connections with both grassroots and institutional environmental health advocates in the state, including GroundworkRI and the Providence Parks Department. The partnership with GroundworkRI is a noteworthy example of the symbiotic relationships the Lab has forged with community organizations through this project; the executive director of GroundworkRI serves on the study's advisory board, offering feedback and recruitment support, while the Lab has provided data collection and analysis expertise to measure the efficacy of their tree-planting initiatives.

CONCLUSION

Importance of this work

Ideally, results from Project G-SPACE will add a health perspective to the important greenspace work already going on in Rhode Island communities, and justify the existence and expansion of these programs. Greenspace exposure is a significant environmental determinant of child morbidity and mortality.¹⁰ Findings from a 2024 study of 2,103 children

ages 2 to 5 years old report that increased greenspace exposure is associated with fewer early-childhood internalizing symptoms such as anxiety and depression.¹¹ However, limited research has been conducted in diverse cohorts of United States children in middle-to-late childhood living specifically in urban cities, a key gap addressed by Project G-SPACE. Childhood consists of important developmental windows where factors such as a lack of daily exposure to greenspace and insufficient sleep can have cumulative effects on learning, emotional health, and long-term wellbeing. In urban communities like Providence, understanding the role of greenspace in attenuating adverse health effects and promoting improved wellness strengthens efforts to address disparate health outcomes facing the city. Project G-SPACE is not only relevant to the community as a collective, but also has significant implications for families, schools, and city-wide organizations that strive to mobilize evidence-based research to enhance children's quality of life and daily habits; through generating locally grounded data, the study can inform programming and tailored public-health initiatives that seek to ensure each child has access to safe and quality greenspace, bridging research with practice.

The Future

Project G-SPACE illustrates the strength of research-community partnerships to promote the health and wellbeing of Rhode Islanders. Preliminary findings suggest there are protective effects of greenspace exposure and physical activity on sleep quality and mental health of elementary school-aged children. Given the diverse population across the state, it is important to investigate these outcomes stratified by sociodemographic factors to uncover potential health disparities. Forthcoming longitudinal analyses will further elucidate these pathways to help identify mechanisms for equitable research and policy intervention. Existing greening initiatives such as tree planting and landscape design are likely to have indirectly impacted these results. To maximize greenspace resource allocation and related health benefits, future work should leverage strategic collaborations between researchers, community organizations, and other stakeholders to directly evaluate greening programs and initiatives.

References

1. Marrazzo G, Raimondi A. 2025. The role of urban trees as nature-based solutions for stormwater runoff control. *Urban Forestry and Urban Greening*. 2025; 103:128598.
2. Nature Everywhere Community Spotlight: Providence, Rhode Island | C&NN. *Children @ Nature Network*. Retrieved November 25, 2025, from <https://www.childrenandnature.org/resources/community-spotlight-providence-rhode-island/>
3. GroundworkRI. 2025. *Groundwork Rhode Island*. <https://groundworkri.org/>
4. Groundwork Rhode Island. *About – Groundwork Rhode Island*. <https://groundworkri.org/about/>

5. Providence Neighborhood Planting Program. 2025. <https://pnpp.org/>
6. Providence opens first 'green schoolyard.' 2022, November 21. *WPRI.com*. <https://www.wpri.com/news/local-news/providence/providence-opens-first-green-schoolyard/>
7. Grigsby-Toussaint DS, Shin JC, Acevedo AR, et al. 2024. Project G-SPACE: protocol for exploring the influence of green space on sleep and mental health among children. *BMC Pediatrics*. 24(1): 783. <https://doi.org/10.1186/s12887-024-05247-3>
8. Rhode Island Healthy Schools Coalition. *Our organization*. <https://www.rihsc.org/our-organization/>
9. The Providence Green Schoolyard Initiative—Outdoor Learning Ideascapes -11172022. *City of Providence*. Retrieved November 25, 2025, from <https://www.providenceri.gov/the-providence-green-schoolyard-initiative-outdoor-learning-ideascapes-11172022/>
10. Who we are | Thrive outside. Thrive Outside. <https://www.thriveoutside.info/about-5>
11. Zhang L, Wang Q, Lei R, et al. Greenness on mortality of infant and under-5 child: A nationwide study in 147 Chinese cities. *Ecotoxicology and Environmental Safety*. 2024;286:117184.
12. Towe-Goodman N, McArthur KL, Willoughby M, et al. Green Space and Internalizing or Externalizing Symptoms Among Children. *JAMA Netw Open*. 2024;7(4):e245742. doi:10.1001/jamanetworkopen.2024.5742

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Disclosure

None of the authors has anything to disclose.

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