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Populations are becoming increasingly urbanized, and this trend is projected to continue for the foreseeable future. Urban living provides a wealth of amenities, but they are often not equally distributed. Access to greenspace is no exception. It has been shown that trees, parks, trails, etc. provide a multitude of physical, social, and cultural benefits to urban residents, including improved air quality, temperature and urban climate regulation, stormwater management and flood reduction, improved neighborhood aesthetics, a sense of community, and reduction of stress and improved mental health. However, availability and access to trees and spaces that provide these benefits is not uniform, with lower income and minority neighborhoods often underserved. This is an environmental justice issue that most cities face as they attempt to combat climate change with green initiatives and city planning that incorporates greenspace into the urban infrastructure. Remedying the inequitable distribution of greenspace is a complex and challenging problem with no easy answers, but it is one that cities must address as their populations grow and as our climate changes.

As more cities undertake green initiatives, it is important to gain the support of residents, stakeholders, and policy makers. People and publications that can communicate the need for greenspace and the benefits it provides in an easily understandable and relatable way are key for getting these various parties involved and invested. The “City Trails: Improving Equitable Access” article by Headwaters Economics is one such publication that addresses efforts and reasons to develop urban trails and focuses on ways to do so in an equitable manner. Trails and parks create substantial benefits for residents and cities are increasingly including greenspace as part of their city planning, development, and revitalization schemes, but they are still often

absent or less abundant in poorer and minority neighborhoods. History of urban segregation, less available space for greenspace development, and lack of ethnic representation in trail and conservation organizations create challenges to overcoming this environmental injustice. Improving access to these amenities for all residents, especially those in historically underserved neighborhoods, will take careful thought and planning, the use of new technologies, and a willingness to think outside of the box to utilize non-traditional and novel public spaces.

This article is a straightforward and well-written piece that can appeal to the general public. The author gives interesting and specific examples of how parks and greenspace benefit communities and individuals, and they do a good job of making the case for why access to these amenities should be developed and improved. It is hard to refute their evidence and arguments for the benefits of trails and parks; their examples, like the health of kids who live close to a park compared to those who don't, make intuitive sense and appeal to readers' sensibilities. The idea of using crowdsourced data to track trail use was also interesting and novel, and potentially a good tool to help complete the picture of who is using trails and when. However, it seems that this method might also have a few pitfalls and not reflect a truly representative sample of community members. It relies on GPS data from social media and fitness trackers which are more likely to be on the arms of more affluent members of the community who have the means to afford such devices as well as the leisure time and ability to recreate on the trails. People who can't afford or simply don't use these technologies will not be represented. There is also a privacy issue that must be addressed when using people's data. While the crowdsourcing idea can probably provide some new and useful information, especially, as the article points out, in conjunction with traditional trail trackers and in-person surveys, its shortcomings must also be acknowledged.

The “Back To Green” TED Talk was also an approachable way in which to educate the general public about the importance of increasing greenspace in city infrastructure. Michael Messner made a comprehensive case for his plan to add parks to downtown Charleston, SC. This presentation made an impact because the speaker was a professional and relatable individual who had some solid experience to draw upon. The fact that he compared the greening plan with an expensive road construction project, and showed that a large parks project could be accomplished with just a fraction of that cost is something that I think would resonate with people and get them to pay attention. He also made a good case for returning the goals of city planning to ones that mirror those of earlier urban planners, with a focus on public parks. Invoking the names of Fredrick Law Olmstead and perhaps the most well-known public park - New York City’s Central Park - gave the audience a great example of how making greenspace a priority can be immensely successful. Connecting future plans to the past and showing that it would not be as expensive or complicated as naysayers may think are important and effective ways to sell an idea like this. His use of aerial maps gave the audience a concrete and easily understandable view of the proposal, and made it seem attainable rather than abstract. I liked that he used before-and-after pictures of the spaces that he is proposing changes to in order to give the audience an idea of what this project could accomplish. When introducing green projects, I think that it is crucial to have knowledgeable and relatable people present the ideas in a way that the audience can immediately understand. Presenters familiar with the area or with personal ties to the region make the proposals more approachable. Maps, pictures of the proposed results/changes, and a reasonable financial breakdown can go a long way to convincing people that this sort of project is feasible and worth pursuing.

The paper, “What Does It Take to Achieve Equitable Urban Canopy Distribution? A Boston Case Study” by Danford et. al. was a more dense read than what many in the general

public may be used to, but it was still fairly straightforward and understandable. While it took some concentration and careful reading to grasp some of the nuances of the author's methods, it wasn't overly jargon-heavy or obscure. The researchers divided Boston into neighborhoods based on existing traffic zone data, then used pre-existing population projections, socioeconomic data, and tree canopy data to project a variety of scenarios of differing population growth and tree planting distribution to see how the city might be able to focus their efforts to achieve more equitable tree coverage. The first scenario, "Current Trends," assumed that the population would continue on its current path, with no special focus on growth in the urban center or additional tree planting efforts. The second scenario, "Metro Future," assumed increasing densification in downtown Boston as well as an increased investment in urban greening. A third scenario, "Green Equity," assumed a moderate population increase and emphasized increasing urban canopy cover in underserved areas, aiming for an overall canopy cover of 40%. The fourth scenario used the goals of the city's "Grow Boston Greener" initiative, which aims to increase canopy cover from the current 29% to 35% by planting 100,000 trees by 2020 and focusing on the upkeep of current trees. The fifth scenario, "All Trees," provided an upper limit for tree distribution by imagining a tree planted in every available site regardless of socio-economic factors.

After taking into account factors such as canopy loss due to population growth, available planting area and potential, canopy size, and making realistic assumptions regarding planting efforts and distribution, the researchers estimated canopy cover in each neighborhood. The results indicated that the tree canopy cover targets were met only in the scenario in which every possible tree was planted (All Trees). The other scenarios came in below their targets. Notably, the Grow Boston Greener plan underperformed, and could only meet its goal within its proposed time frame by assuming unrealistic tree crown diameter sizes. Equity goals were also not

reached in any of the scenarios. The scenario that focused on adding greenspace to underserved neighborhoods (Green Equity) performed the best, but still fell short of true equity.

The results of this study uncovered a few factors that city planners must address when attempting to add greenspace and trees in an equitable manner. First, predictors of tree canopy distribution depend on historical and cultural context and are individual to each city. It was a bit surprising to find that Boston's canopy cover was actually positively related to minority population percentage. This is probably due to minority communities being further from the city center and also due to the regrowth of vacant lots, but it emphasizes the fact that each city must examine its own socioeconomic factors to properly identify underserved communities. Second, the importance of the availability of planting space can not be underestimated, and is a significant barrier to achieving equity. Finally, planners must realize that well-intentioned initiatives to plant trees are probably not enough. Funding, levels of stakeholder involvement and disagreement, neighborhood cultural dynamics, and other limitations make achieving lofty goals quite difficult. This study concludes that policies must be more comprehensive and take into account these challenges, realize that space constraints will prevent equitable greening when tree planting alone is the main focus, and understand that the use of alternative greening strategies and land use policies will be crucial to increasing equity. They note, however, that even small clusters of trees are valuable, and that planting initiatives are still important even if true equity is not attainable through that method alone.

I thought this was a clever and informative way of looking at this problem. By creating different scenarios that are all plausible, if not completely practical, the researchers shed some light on the feasibility of the Grow Boston Greener initiative and how the city might better achieve its goals. By comparing Boston's actual plan to other scenarios, it highlighted shortcomings and helped suggest some ways to make the plan more comprehensive. This

study serves as a lesson and guide for other cities looking to create more environmental equity. While every city may not have the ability to do a similar in-depth look at its own situation, the lessons learned here are transferable. As cities face environmental challenges, including easing environmental injustices, they can use case studies such as this one to make their own plans more successful.

Published research papers are probably not the best way to inform the general public about green initiatives as they are denser and longer reads that often require scientific knowledge that many may not have. However, scientific studies are critical to understanding the nuances of environmental injustice problems and can help to form the groundwork for creating green initiatives that are responsible, practical, and achievable. It is important not only that these studies are undertaken but also that the results are distilled and communicated to stakeholders, policy makers, and residents in a relatable and understandable format.