

ICLEI USA Google Action Fund

Data-Driven Urban Forestry for Climate Resilience in Pittsburgh, PA

Overview

- **Grantee:** Resilient Cities Catalyst
- **Local Government Partners:** City of Pittsburgh, Pennsylvania
- **Project Period:** January 2023 – October 2025



Project Abstract

Resilient Cities Catalyst (RCC) partnered with the City of Pittsburgh to develop a data-driven and replicable approach to urban forest management aligned with the city's Climate Action Plan goals. The project focused on strategically expanding Pittsburgh's tree canopy to deliver multiple climate resilience benefits, including reducing extreme heat, mitigating flood risks, and improving community health. By integrating climate risk, social vulnerability, and urban canopy data, the project developed new tools to prioritize where tree planting would deliver the greatest climate and equity benefits. Pilot tree plantings, policy recommendations, and regional collaboration helped demonstrate how nature-based solutions can be deployed strategically to strengthen climate resilience across the city and surrounding municipalities.



Photo credit: Resilient Cities Catalyst (RCC)

Volunteers and project partners receive instructions during a pilot tree planting event in the Homewood neighborhood of Pittsburgh.

Key Objectives

The project was designed to achieve the following climate and governance objectives:

Integrate Climate and Urban Forestry Data Across City Systems

The project combined new and existing datasets—including climate risk models, tree canopy data, and social vulnerability indicators—to create a unified data framework for informing climate-smart urban forestry decisions across municipal departments.

Prioritize Tree Planting in Frontline Communities

A parcel-level prioritization system was developed to identify neighborhoods facing high heat exposure, flood risks, and socioeconomic vulnerability. The Tree Impact Zone analysis tool developed with grant funding enables the City to focus limited funding on plantings in areas where urban canopy expansion can provide the greatest climate and equity benefits.

Demonstrate Data-Driven Urban Forestry Through Pilot Projects

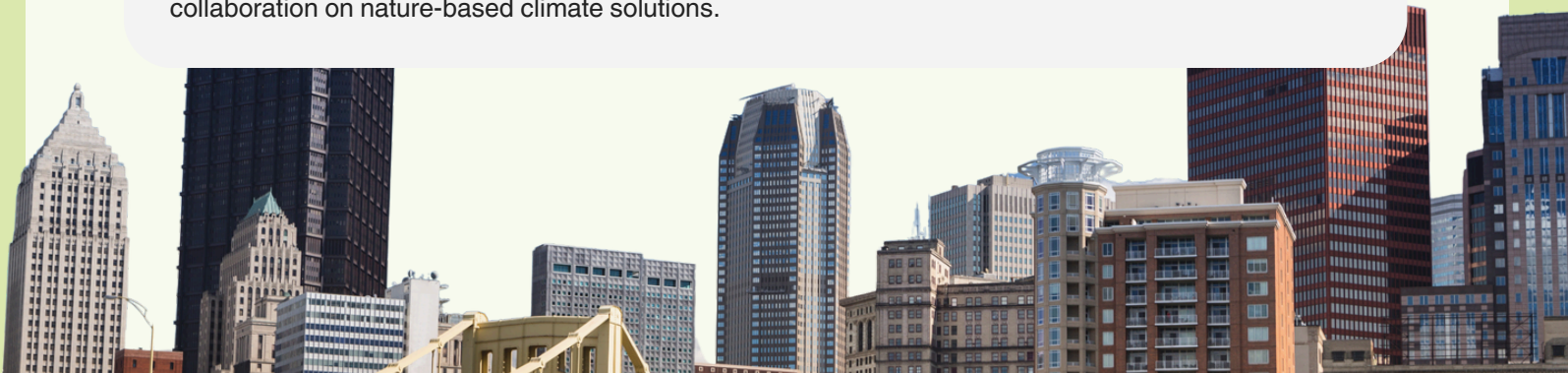
Combining a data-driven decision making tool with a pilot tree planting initiative demonstrates how data can guide practical climate adaptation interventions in the most at-risk neighborhoods.

Develop a Strategic Framework to Expand Pittsburgh's Urban Canopy

The pilot plantings and tools informed the development of a roadmap for how Pittsburgh can scale its urban forestry program to plant 100,000 trees over ten years through innovative funding mechanisms.

Strengthen Regional Capacity for Urban Forestry and Climate Adaptation

A regional Municipal Tree Canopy Cohort will share lessons learned and inform future work with neighboring municipalities across Allegheny County, helping scale the project's impact and strengthen collaboration on nature-based climate solutions.

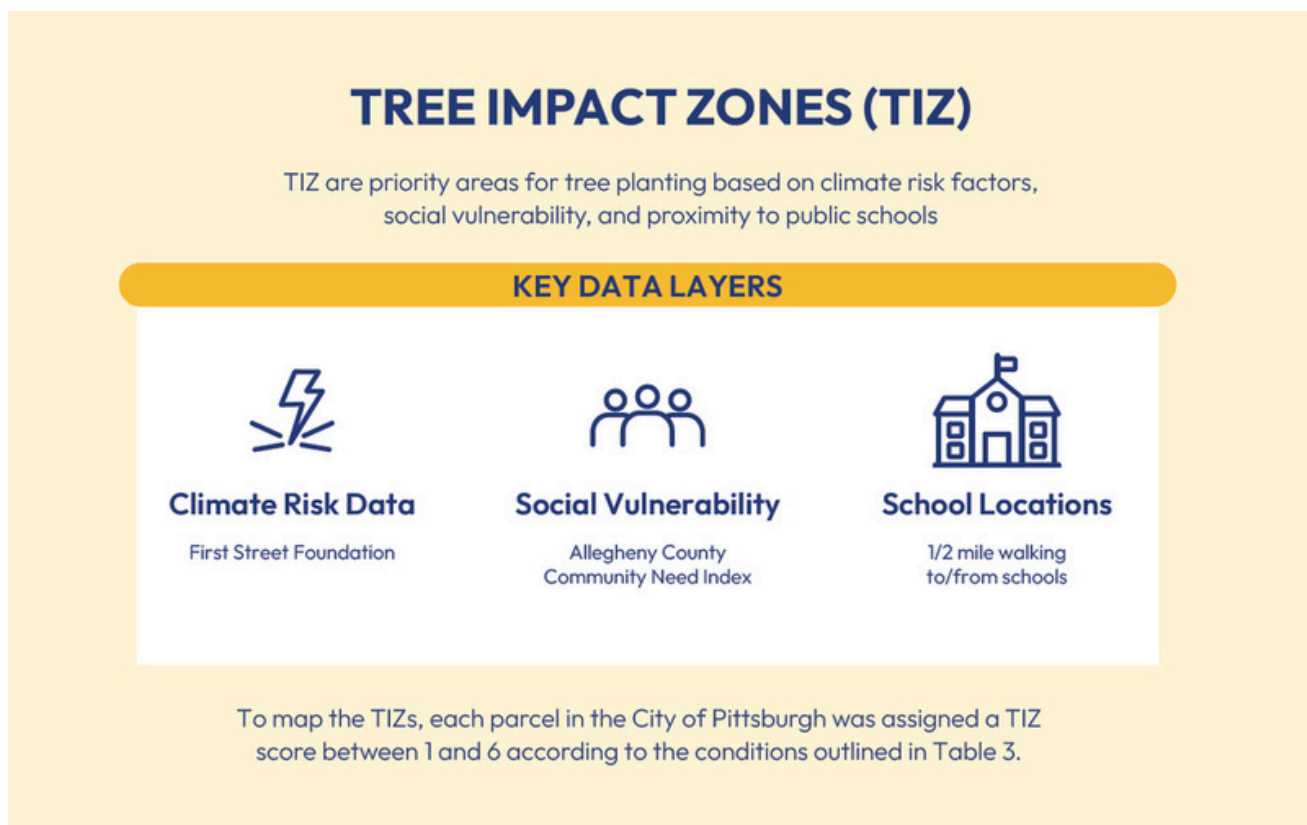


Use of Data to Drive Climate Action

A central component of the project was the development of a Tree Impact Zone (TIZ) prioritization tool, designed to help the City of Pittsburgh identify where new tree planting would deliver the greatest climate resilience benefits. The tool integrates multiple datasets—including climate risk projections from the First Street Foundation, historic stream mapping, the Allegheny County Community Need Index, and school location data—to assess heat exposure, flood risk, and social vulnerability at the parcel level across the city.

Using geographic information system (GIS) analysis, each parcel in Pittsburgh was assigned a priority score based on overlapping climate and social risk factors. Areas experiencing high heat and flood risks, low tree canopy cover, and proximity to schools were ranked as the highest priority zones for tree planting. This approach allows the city to prioritize investments in neighborhoods where trees can most effectively reduce climate risks and support at-risk residents.

The project also developed a “tree potential” analysis, which estimates where additional trees could be planted based on available space on individual parcels. The analysis identified potential space for more than 660,000 additional trees across the city. Together, the TIZ tool and tree potential mapping provide a practical decision-support framework that helps city staff and nonprofit partners strategically expand urban canopy while maximizing climate, health, and equity benefits.



*Photo credit: Resilient Cities Catalyst (RCC)
Tree Impact Zones*

Achievements

The project delivered important environmental, community health, and climate benefits to the City and its residents:

Expand Pittsburgh's Urban Tree Canopy in At-Risk Neighborhoods

The project increased urban tree canopy by planting 300 trees in three neighborhoods with high climate vulnerability and low canopy cover—Hazelwood, Beltzhoover, and Homewood.

Engage Community in Tree Planting Initiatives

Nearly 200 residents participated in community tree planting events serving neighborhoods with approximately 8,000 residents.

Advance Nature-Based Solutions

Trees planted through this initiative will deliver short-term carbon sequestration benefits of approximately ~2.97 metric tons CO₂e annually; over the lifetime of these trees will remove approximately 298 metric tons CO₂e by sequestering carbon pollution and delivering energy-savings through shade effects. When mature, shade trees planted through this initiative are expected to lower surface temperatures by approximately 9–12°F significantly reducing urban heat islands in these neighborhoods.

Improve Local Urban Forestry Planning and Implementation

The project delivered three important tools for improving local governance or urban tree canopy including a Tree Impact Zone (TIZ) prioritization tool, updated Standard Operating Procedure for data-driven tree planting across city departments and agencies, and Strategic reports—Planting with Purpose and Putting Down Roots—that will guide future local investments in Pittsburgh's urban tree canopy.

Build Regional Capacity

A Municipal Tree Canopy Cohort led by The Congress of Neighboring Communities (CONNECT) and Tree Pittsburgh brought together 29 municipalities in Allegheny County to share best practices and expand urban forestry strategies regionally.

Unlock Additional Funding for Tree Planting

The project identified opportunities to finance tree planting through existing municipal funding sources, including the Shade Tree Trust Fund, Parks Trust Fund, stormwater fees, and infrastructure projects. Strategic reports produced through the project identified 13 potential innovative funding mechanisms that could generate between \$1 million and \$6 million annually to support expanded urban forestry investments.



“Working with ICLEI and Resilient Cities Catalyst allowed us to rethink how Pittsburgh manages its urban tree canopy.”

“This project gave us the space and resources to bring together departments and community partners to improve how we plan and implement tree planting. We now have stronger processes, better data, and new partnerships that help us provide a more climate-informed service to residents.”

- Kyla Prendergast, Senior Environmental Planner, City of Pittsburgh

“Through this partnership, we were able to scale urban forestry strategies across dozens of municipalities in Allegheny County.”

“The workshops and collaboration helped local leaders connect with technical experts and explore new ways to strengthen regional tree canopy programs. The success of the cohort has created momentum to move from knowledge sharing toward collaborative implementation.”

- Rebecca Kiernan, Director of Collaborative Funding, CONNECT

Lessons Learned & Next Steps

This project resulted in many lessons that will inform future work across the City and the broader region:

Community Partnerships Are Essential for Expanding Tree Canopy

Since most canopy growth potential lies on private land, trusted community organizations and nonprofit partners play a crucial role in engaging residents, building support for tree planting, and engaging volunteers in tree planting efforts.

Data Helps Move Urban Forestry from Reactive to Strategic

Integrating climate risk and vulnerability data will allow Pittsburgh to shift from a resident “request-based” system to a proactive approach that targets planting resources to maximize climate resilience and equity benefits for residents.

Cross-Departmental Coordination Strengthens Climate Implementation

Establishing an interdepartmental urban forestry working group helps facilitate alignment among city agencies and identification of opportunities to integrate tree planting into other infrastructure projects.

Sustainable Funding Is Critical for Long-Term Impact

Achieving Pittsburgh’s goal of planting 100,000 trees over the next ten years will require new innovative funding and financing strategies and stronger partnerships but existing municipal programs can be tapped in innovative ways to advance tree planting initiatives.

Institutionalizing Data-Driven Urban Forestry

The city plans to continue leveraging the Tree Impact Zone tool, updated planting procedures, and regional partnerships to scale tree canopy investments and advance long-term climate resilience.

Conclusion

The Pittsburgh Urban Forestry project demonstrates how cities can use data to advance equitable nature-based solutions to climate challenges. By integrating climate risk modeling, urban canopy data, and social vulnerability indicators, the project created a practical framework for prioritizing tree planting where it will have the greatest impact. This approach ensures that climate investments deliver multiple benefits, including sequestering carbon pollution, improving public health, reducing heat exposure, and enhancing the quality of life for residents.

The project also highlights the role of urban forests as essential “natural infrastructure.” Trees provide a wide range of benefits—including reducing urban heat island effects, producing shade that lowers energy consumption, absorbing stormwater, and improving air quality—making them one of the most cost-effective tools cities have for adapting to the impacts of climate change. Strategic investments in urban tree canopy can deliver multiple environmental and social co-benefits while building community resilience to increasing risks of heat and flooding.

Finally, the initiative demonstrates how partnerships and data-driven planning can transform municipal climate action. Through collaboration among city agencies, nonprofit partners, and regional municipalities, the project developed new tools, policies, and institutional frameworks that will continue guiding Pittsburgh’s urban forestry strategy long after the grant period ends. By treating trees as critical infrastructure and prioritizing equitable investments in the urban canopy, Pittsburgh has established a replicable model that other cities can adopt to advance their climate resilience and biodiversity goals.

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Photo credit: Resilient Cities Catalyst (RCC)

Project partners included City of Pittsburgh, Tree Pittsburgh, and Resilient Cities Catalyst staff